DOCUMENT RESUME

ED 178 232 RC 011 547

AUTHOR	Densmore, Tom, Comp.; And Others
TITLE	Sixth Grade Outdoor Education Program. Outdoor Curriculum Guide.
INSTITUTION	Dixon Public Schools, N.J.
PUB DATE	78
NOTE	195p.; Contains some light print
EDRS PRICE	MF01/PC08 Plus Postage.
DESCRIPTORS	Art Activities; Curriculum Development; *Environmental Education; *Experiential Learning; Grade 6; *Group Activities; Group Relations; Instructional Materials; Intermediate Grades; *Learning Activities; *Outdoor Education; Problem Solving; *Recreational Activities; Resident Camp Programs; Resource Materials; Safety; Socialization; Units of Study
IDENTIFIERS	*Dixon Public Schools IL

ABSTRACT

Compiled for teachers whose sixth grade students participate in the resident camping program of the Dixon Public Schools (Dixon, Illinois), this guide offers extensive and detailed information for use in planning the camp curriculum. Activities are suggested for environmental study, group socialization, and recreation. Environmental study units include orienteering, weather study, identification of plants and animals, geology, and astronomy. Background information is included for each unit along with suggested activities, instructions, and lists of materials needed. The geology section, for example, provides information on regional geological history, illustrations of fossils commonly found in the area, and procedures for conducting soil study and gully study units. Socialization activities require group problem solving efforts and facilitate the sharing of experiences. Recreation covers the evening campfire from fire building to songs and skits, art projects using natural materials, 15 types of hikes that develop awareness of natural surroundings, and outdoor cooking including menus and 80 recipes for outdoor meals. The guide lists safety and emergency procedures specific to the program as well as first aid measures for common camping injuries. (JH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED178232

OUTDOOR CURRICULUM GUIDE

SIXTH GRADE OUTDOOR EDUCATION PROGRAM

DIXON PUBLIC SCHOOLS

DISTRICT 170

COMPILED SPRING 1978

BY

Tom Densmore
Jean Harris
Steve Hill
Gene Lemme
Joan Lemme
Carol Leslie
Jackie Radandt

RC 011547

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Stanley Weber

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

TABLE OF CONTENTS

Superintendent's Statement

Program Objectives

Site Regulations and Procedures

Site Map

Equipment Available at Site

School Equipment Available

Suggestions for a Successful Program

Student's Day Schedule

Bibliography

Teacher Pre-program Preparation

Pupil Preparation

Parent Permission Form

Student Clothing and Equipment Needs

Safety and Emergency Procedures

Lesson Plans

Outdoor Education

Dixon elementary students in the upper intermediate grades have participated in outdoor education since the early 1960's, first at the Lorado Taft Campus as guests of Northern Illinois University and for the past ten or more years at a number of area campsites under the sponsorship of the school district.

Thousands of youngsters and many classroom teachers have explored the woods, waded the streams and walked the fields in this program. Their knowledge and skills have been broadened and refined as they learned to identify plants, trees, flowers, insects, marine life and rock formations. Many of them also have an increased awareness of the world around them as they learned to more effectively use their eyes, ears, nose and sense of touch.

Probably of even greater significance, these youngsters acquired an appreciation and respect for the beauty and the mysteries of the outdoors. Hopefully, they also have an increased appreciation of the need to conserve our natural resources.

Fifth and sixth grade classroom teachers have been the backbone of Dixon's program. Also, three other dedicated teachers have been very important to the program providing continuity, encouragement and assistance. These persons have contributed not only expertise to the program, they brought enthusiasm, interest and dedication to both their students and the concept of outdoor education.

Possibly the greatest value of the program, particularly the residential program, to the teachers is the opportunity provided through their living together with their students in an informal setting. It gives the youngsters an opportunity to see and appreciate them as human beings -- not as authority figures in their classrooms. The teachers also become better acquainted with their students -- learning more about their hopes and aspirations and their relationships with their peers.

Our district has not made an effort to secure empirical evidence to justify the existence of the outdoor education program; however, those of us who have worked to develop and sustain it know that both students and teachers enjoy and appreciate learning in the outdoors.

Stanley Weber

Stanley Weber, Superintendent

SW/rr
4/14/78

OBJECTIVES OF THE DIXON OUTDOOR EDUCATION PROGRAM

1. To motivate children to develope positive attitudes toward education through the use of the direct first hand experiences.

2. To encourage students to live democratically and cooperatively with other students and adults and thus improve human relationships.

3. To cultivate the student's awareness of his natural environment and to develop a concern for its conservation.

4. To encourage the use of the outdoors to develope good health and physical fitness.

5. To develope skills and interests in outdoor activities which will carry over into later life.

RULES FOR LCA

1. Retreat houses:
   a. Do not lock doors, play with fire extinguishers or use pillows for purposes other than sleeping.
   b. Fires and smoking are not permitted.
   c. Grafitti, names, dates, etc., are not to be recorded on the buildings. If anything is observed, please report to camp office.
   d. No food is to be stored or consumed in the Retreat Houses.
   e. Do not adjust thermostats.
   f. Keep outside doors shut.

2. Please treat the environment with respect!
   a. Do not litter.
   b. Discourage the picking of live plants.
   c. Do not throw stones.
   d. Observe animals, don't handle.
   e. Leave only footprints, take only memories.

3. Please use the path between the Dining Hall and the Meadows Village.

4. Automobiles: Please park in the designated areas by villages and in the parking lot by the administration building, not by the Dining Hall.

5. All barns are off limits.

6. Please stay off the grass on the slope between the pool and the Dining Hall and the grass around the Dining Hall.

7. Dining Hall:
   a. Use only the exit in the lounge.
   b. Remove shoes if they are muddy at the entrance door.
   c. Follow all Dining Hall procedures.

8. Reference Library: All books stay in the Dining Hall.

LCA DINING HALL PROCEDURES

1. Table hoppers (one for each table) set tables 10 minutes before each meal.
   Meal times are 8:15 A. M. - Breakfast
   12:00 Noon - Lunch
   5:30 P. M. - Supper

2. The remainder of the group is asked to wait in the lounge or outside until instructed to enter the dining area for the meal.

3. Table grace will be sung by everyone wishing to do so.

4. At the first meal for each group this information will be explained so that each meal can be run smoothly.

5. Table Hopper - The designated person from each table is responsible for obtaining second helpings and returning the dishes and silverware for cleaning at the end of each meal.

6. First course -
   a. This is served by the dining hall staff.
   b. There is enough served on the first helping for each person at the table to have a fair share.

7. Seconds -
   a. The table hopper may go to the serving window via the hallway by the men's room. Please return to the dining hall via the coffee server.
   b. Please do not go for seconds until all the firsts are served.
   c. Please be prepared to indicate to the cooks the quantity of the item. In other words, how many want seconds.

8. Dessert - This is served by the dining hall staff. Sorry, no seconds on dessert.

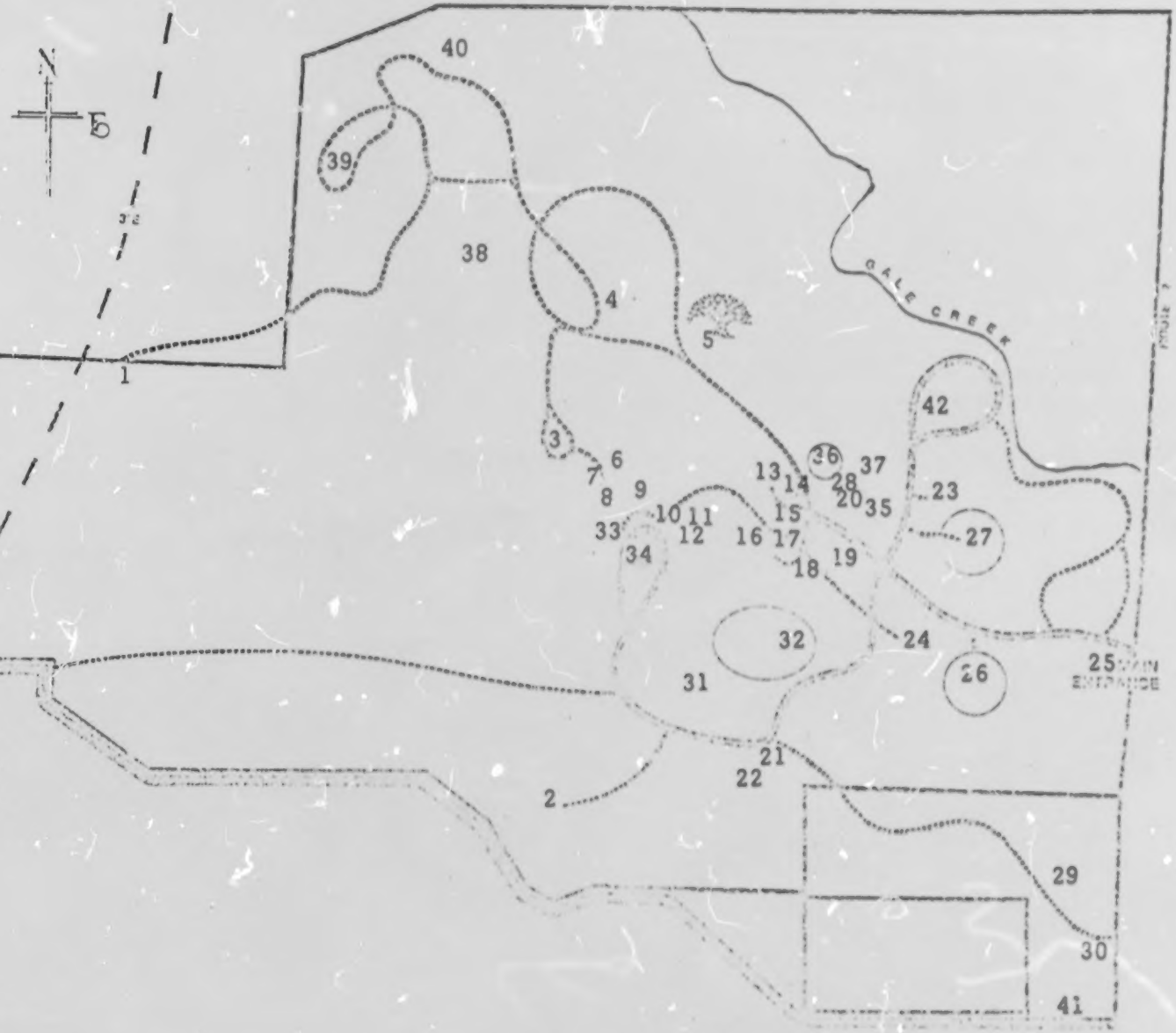
9. Conclusion of the meal -
   a. Scrape all scraps in the waste bucket, usually found beneath one of the chairs at the table. The waste bucket goes to the wash window.
   b. Gather all paper and place in the garbage can.
   c. All liquids remaining in glasses, cups, and milk cartons at the end of the meal are to be poured into the pail on the table near the men's room. Please do not empty water or punch containers into this bucket.
   d. Return all serving containers and pitchers which still have food or drink in them to the serving window.
   e. At the table, organize the plates, empty serving bowls and pitchers, knives, forks, and spoons.
      --the plates, empty serving bowls and pitchers are returned to the wash window.
      --the knives, forks, and spoons are placed in the appropriate tubs to the right of the wash window.
   f. The napkin holder and salt and pepper carrier remain on the table.
   g. The dining hall staff will wash off the tables; however, please look on the floor for papers and spills and clean up as best you can.

10. Special situations -

a. When a salad table is provided, Jean or Carol will instruct your table when to go.

b. When milk is not served at the table, it is available at the table with the pail for liquids.

c. If you wish to take time after the meal is ended to visit over a cup of coffee, please complete the clean up procedures first.



LUTHERAN OUTDOOR MINISTRIES CENTER
Oregon, Illinois 61061

1. Outcamp
2. J.B.—campfire area
3. Lewis cave
4. Stony Point—campfire site
5. Freedom Tree
6. Timbers meeting basement
7. Timbers B Primitive House
8. Timbers A Primitive House
9. Timbers Washhouse
10. Meadows B Primitive House
11. Meadows meeting basement
12. Meadows A Primitive House
13. Nye Point—campfire site
14. Pole Barn
15. Dining Hall and lounge
16. Middle Point Restrooms
17. Pavilion and concession
18. Carry Barn
19. Pavilion—campfire site
20. Activities Building
21. Bridge House
22. Bridge Hill
23. Cabin A Camping Site
24. Multipurpose Camping Site
25. Property Maintenance Residence
26. Pavilion
27. Ranger Cabin
28. Restrooms
29. Bunkhouse Camping Site
30. Deep Backpack Camping
31. Play Field
32. Sports Challenge Course
33. Tipi Camp Site
34. Play Field
35. Administration Building
36. Dome
37. Play Field
38. Cricket Frog Pond
39. Turtle Pond
40. Pavilion Site
41. Duck Pond Meeting House
42. Tent Theater Area

9

1(

Lutheran Outdoor Ministries Center

1. Outcamp
2. J B - campfire site
3. Levi's cave
4. Stony Point - campfire site
5. Freedom Tree
6. Timbers meeting basement
7. Timbers B Retreat House
8. Timbers A Retreat House
9. Timbers Village parking
10. Meadows B Retreat House
11. Meadows meeting basement
12. Meadows A Retreat House
13. New Revival campfire site
14. Pole Barn
15. Dining Hall and Lounge
16. Hillside Retreat House
17. Pool and bathhouse
18. Dairy Barn
19. Festival - campfire site
20. Administration Building
21. Barber House parking
22. Barber House
23. Old Revival Campfire Site
24. Muhlenberg Campfire Site
25. Property Manager's Residence
26. Proposed hogan area
27. Hogan/tent area
28. Picnic area
29. Backbone Campfire Site
30. Devil's Backbone Outcropping
31. Play Field
32. Stress/Challenge Course
33. Timbers Campfire Site
34. Play Field
35. Administration Parking
36. Corral
37. Play Field
38. Cricket Frog Pond
39. Turtle Hill
40. Railroad Ridge
41. Devil's Backbone Road
42. Tent/Trailer Area

EQUIPMENT AT SITE

LCA Equipment

- Volley ball nets
- Canoes
- Basketball hoop
- Piano
- Indoor fireplace
- Outdoor fire rings
- Stres/Challenge course

School Equipment

1. Recreational Equipment
   - Tug of war rope
   - Basketballs
   - Volleyballs
   - Footballs
   - Frisbees
   - Baseball and bat
   - Scoop ball
   - Board games (chess,checkers, etc.)
   - Cards
2. Library Books
   Nature books will be checked out of school libraries to be used in a resource center for students. Also available will be many issues of "National Geographic World", "Ranger Rick", and "National Wildlife". These books and magazines are to be used only in the Dining Hall. They are never to be checked out.

Supplies such as glue, paint, paper, etc., are available in limited quantity due to Outdoor Education's limited budget. Any supplies that teachers can bring from their own classroom are helpful.

The following materials are available for your use. They may be checked out by calling Carol Leslie (288-2454).

MATH

4	trundle wheel (1m)
4	plane table
29	compass - 11 (18 new)
1	lg. demo compass
5	meter sticks (1m)
3	calliper
1	folding meter tape
2	thermometer
25	30cm rule
2	square metre sticks
1	100cm stick
10	tape measures
1	20m tape
1	50m tape
1	map measure
1	micrometer
1	2m steel tape

Rock and minerals of IL

1	seine
2	plankton nets
2	dip nets
2	white granite pans
6	strainers
15	clipboards
3	hammers
24	magnifiers
20	blindfolds

SUGGESTIONS FOR A SUCCESSFUL PROGRAM

1. Enthusiastic teachers have enthusiastic students.

2. Always have an alternate lesson available in case of inclement weather.

3. Have available a list of all student's names, parent's names and phone numbers.

4. Know and understand all emergency procedures.

5. A program will be more successful if you remain with the students the entire time of the outing.

6. Make sure students understand all rules before going out to the camp.

SAMPLE

GENERAL DAILY SCHEDULE

7:15 A. M.	Rise 'n Shine
8:05 A. M.	Hoppers Report
8:15 A. M.	Breakfast
9:00 A. M.	Study Areas
11:45 A. M.	Hoppers Report
12:00 Noon	Noon Meal
12:30 P. M.	Rest and Relaxation
1:30 P. M.	Study Areas
4:00 P. M.	Special Interest Areas
5:20 P. M.	Hoppers Report
5:30 P. M.	Evening Meal
6:15 P. M.	Group Recreational Activities
8:00 P. M.	Star Gazing Night Hikes Campfire
9:45 P. M.	Clean-up for bed
10:15 P. M.	Lights out
	All quiet

BIBLIOGRAPHY

Angier, Bradford, Field Guide to Wild Edible Plants, Harrisburg, Pa., Stackpole Books, 1973

Bale, R.O., Creative Nature Crafts, Purgess Publishing Co., Minneapolis, Minnesota, 1959

Beetschen, L. Ed., Country Treasures, Random House, U.S.A., 1971

*Benson, Kenneth, Creative Nature Crafts, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1968 (97 pp)

*Brehm, Shirley A., A Teacher's Handbook for Study Outside the Classroom, Charles E. Merrill Publishing Co., Columbus, Ohio, 1969 (100 pp)

Caney, S., Toy Book, Workman Publishing Co., New York, N.Y., 1972

Chandler, S. R., Bruun, B., Zim, H.S., Birds of North America, Western Publishing Co., Racine, Wisconsin, 1966

Duncan, William P. and Harvey, David E., L.I.F.E. Manual; A Resource Guide To Outdoor Activities, George Williams Colleg, Williams Bay, Wisconsin 1976

*ENCHANTMENT OF AMERICA SERIES - Illinois - From Its Glorious Past to the Present

*EXAMINING YOUR ENVIRONMENT SERIES - The Dandelion, Birds, Trees, Snow and Ice Running H^2O, Pollution, Mini-Climates

Fluegelman, Andrew Ed., The New Games Book, Dolphin Books/Doubleday & Co., Inc., Garden City, New York

*Hammerman, Donald R. & Hammerman, Wm. M., Outdoor Education, A Book of Readings, Burgess Publishing Company, Minneapolis, Minnesota, 1968 (401 pp)

*Hammerman, Donald & Hammerman, Wm. M., Teaching in the Outdoors, Burgess Publishing Co., Minneapolis, Minnesota, 1964 (120 pp)

*Hug, John W. and Wilson, Phyllis, Curriculum Enrichment Outdoors, Harper & Row Publishers, Evanston, Illinois, 1965 (214 pp)

*LIFE NATURE LIBRARY - The Reptiles, The Plants, The Mammals

*Mand, Charles L., Outdoor Education, J. Lowell Pratt and Company, New York, 1967 (180 pp)

Medsger, Oliver P. Edible Wild Plants, New York, New York, Macmillan Publishing Company (Collier Books), 1976

Miller, Orson, K., Mushrooms of North America, New York, E.P. Dutton and Co.

*NATIONAL WILDLIFE FOUNDATION - Nature Hunt (An Environmental Investigation)

*Outdoor Education Instructional Materials Packet - Lorado Taft

*PEOPLE AND THEIR ENVIRONMENT - Teachers' Curriculum Guide to Conservation Education (1-12 Outdoor Laboratory) Teachers' Curriculum Guide to Conservation Education (Grades 4-5-6)

Schnacke, D., American Folk Toys; How to Make Them, Penquin Books, Baltimore, Maryland, 1974

*Schramm, Wilber, Classroom Out-of-Doors, Sequoia Press Publishers, Kalamazoo, Michigan, 1969 (193 pp)

*SCIENCE IN ACTION SERIES - Studying Plants, Studying Insects, Studying Soil, Studies for Open Places, Studies for Streams, Studying Mammals, Studies for Woodlands, Studying Birds

Shuttleworth, F.S. and Zim, H.S., Golden Nature Guide Series, Western Publishing Company, Racine, Wisconsin

*Smith, Julian W. and others, Outdoor Education, Prentice-Hall, Inc., Englewood Cliffs, NJ, 1963 (322 pp)

*Swan, Malcolm D. (editor), Tips and Tricks in Outdoor Education, Interstate Printers & Publishers, Inc., Danville, IL 1970 (184 pp)

*Van Der Smissen, Betty & Goering, Oswald H., Nature Oriented Activities, The Iowa State University Press, Ames, Iowa 1965 (219 pp)

Watts, M.W., Flower Finder, Natures Study Guild, Berkeley, Calif., 1955

Watts, M.W., Master Tree Finder, Nature Study Guild, Berkeley, Calif., 1963

Watts, M.W., Winter Tree Finder, Nature Study Guild, Berkeley, Calif., 1970

*The asterisked books are housed in the Central Office. They may be checked out by a personal visit or by calling Ruth Rendleman (ext 21)

OBIS Trail Edition, Set I)
OBIS Trial Edition, Set II) in each school library

Tips and Tricks in Outdoor Education -- in each school

Ten Minute Field Trips -- in each school

Outdoor Education by Mand -- one copy per teacher

TEACHER PRE-PROGRAM PREPARATION

1. Each teacher needs to spend some time preparing his/her teaching unit or study area. Your subject can be one of the ones presented in this book or something of your own choosing. If you select a unit from this book, it can be expanded upon or changed in any way that seems helpful to you.

2. In each respective building, the staff should meet early in the fall to decide what programs will be used during their Outdoor Education experience.

3. There will be a district meeting as early as possible in the fall so that all programs and schedules can be coordinated by Jean and Carol.

4. Each school should have a typed alphabetical list of students including:
   a. parents' name
   b. home phone
   c. emergency phone
   d. any medical problems

   This list should be given to Carol or Jean at the beginning of the session.

5. Each teacher should have a folder containing all of his students' permission slips with them at camp.

PUPIL PREPARATION

1. Permission slips should be sent out two weeks before your school is to go. In the event that a student or his parents are reluctant to participate, personal contact from the teacher or principal is often all that is needed. Outdoor Education is a part of the curriculum and should be treated accordingly.

2. An equipment list should be sent home with each student. It should be discussed carefully so that each child knows the importance of having the proper equipment.

3. Rules of the LCA Camp are included in this book and should be called to the pupil's attention. Students should also be reminded that they are outdoors to learn and proper discipline will be maintained.

4. Carol Leslie will visit each classroom two or three days before you go to LCA and will discuss rules, procedures, and equipment with your students. Students can ask questions at this time. Plan about 20-30 minutes for this activity.

SAMPLE

SIXTH GRADE
OUTDOOR EDUCATION
LUTHERAN CAMP
1977-78

Permission for Dixon Resident Outdoor Education Program

_____has our permission to participate in the Dixon Resident Outdoor Education Program to be held at the Lutheran Camp near Oregon, Illinois.

Each child is completely insured during this program.

Directions for any medication should be turned in to Mrs. Harris along with medicines, labeled with the child's name, upon arrival at the campsite.

Signatures of parents

_____

_____

_____
Address

_____
Phone

PLEASE INFORM MRS. HARRIS IF YOUR CHILD IS UNDER A DOCTOR'S CARE FOR ASTHMA, ALLERGIES, RESPIRATORY PROBLEMS, ETC.

Equipment and Clothing for Camp

Bedroll or sleeping bag
Pillow if wanted
Pajamas
3 pair jeans - T-shirts or blouses
3 pair socks and underwear
Rubber boots, tennis shoes (not new)
RAINCOAT OR PONCHO - CAP OR SCARF
JACKET AND/OR SWEATER
Kleenex
Towel & washcloth
Toothbrush & toothpaste
Soap
Comb
Pencil & small notebook
LARGE PLASTIC BAG TO BRING HOME DAMP CLOTHES
Tote bag
Flashlight

Please do not bring:

Comic books
Radios
Food
Candy or gum

SAFETY AND EMERGENCY PROCEDURES

It is important that we as adults are always aware of the safety of the students in our charge. The very best kind of first aid is prevention of accidents.

While hiking, the students should not be allowed to use walking sticks. They should never throw rocks (or anything else) even if they think no one is near where they are throwing.

Teachers should avoid taking students along the highway or railroad tracks or other dangerous areas.

Teachers should always be aware of number of students in their group and take frequent head counts. This will be easy to do if the group stays together with no one running way ahead or lagging way behind.

In the event of a minor emergency, there will be a first aid kit and ice packs in the Dining Hall. Carol and Jean are both registered first aiders and will be able to assist you.

In the event of a major emergency contact
(1st) Emergency Vehicle in Oregon
732-6225
732-2161
(2nd) Carol or Jean
(3rd) Parents of child
If the child is not being transported by emergency vehicle, contact Carol or Jean to do the transporting. KSB Hospital phone number is 1-288-5531.

Police emergency number is 732-2162.

Ogle County Sheriff number is 732-2136.

In the case of a severe discipline problem, the school principal should be contacted to transport the student in question to Dixon.

SIMPLE FIRST AID

Burns

A. First-degree burns
   1. Apply cold water applications or submerge the burned area in cold water.
   2. Apply a dry dressing if necessary.

B. Second--degree burns
   1. Immerse the burned part in cold water (not ice water).
   2. Apply cloths that have been wrung out in ice water.
   3. Blot dry, gently.
   4. Apply dry, sterile gauze or clean cloth as a protective bandage.
   5. Do not break blisters or remove tissue.
   6. Do not use an antiseptic preparation, ointment, spray.
   7. If the arms or legs are affected, keep them elevated.

C. Third-degree burns
   1. Do not remove adhered particles of charred clothing.
   2. Cover burns with thick, sterile dressings.
   3. If the hands are involved, keep them above the level of the victim's heart.
   4. Keep burned feet or legs elevated--do not allow victim to walk.
   5. Have victims with face burns sit up or prop them up and keep them under continuous observation for breathing difficulty. Maintain open airway.
   6. Do not immerse an extensive burned area or apply ice water over it, because cold may intensify the shock reaction. However, a cold pack may be applied to the face or to the hands.
   7. Transport to hospital as quickly as possible.

D. Chemical burns of the skin
   1. Wash away the chemical with large amounts of water using a shower or hose, if available, as quickly as possible and for at least five minutes. Remove victim's clothing from areas involved.
   2. If first aid directions for burns caused by specific chemicals are available follow these directions.
   3. Apply a dressing bandage and get medical aid.

E. Burns of the eye
   1. Immediately wash eye thoroughly for at least five minutes. Hold eyelids open and pour water from the inner corner of the outward.
   2. Cover eye with dry clean dressing.
   3. Caution victim against rubbing his eye.
   4. Get medical help immediately.

Insect Bites

A. Minor bites and stings
   1. Cold applications.
   2. Soothing lotions such as calamine.

B. Tick bites
   1. Cover the tick with heavy oil (mineral, salad or machine) to close its breathing pores. The tick may disengage at once, if not, allow the oil to remain in place for one-half hour. Then remove the tick with tweezers, taking care that all parts are removed.
   2. With soap and water, thoroughly scrub area from which tick has been removed.

C. Severe reactions
   1. Give artificial respiration if indicated.
   2. Apply a constricting band above the bite on victim's arm or leg. Do not apply tightly. You should be able to slip your index finger under band.
   3. Keep the affected part down below the level of victim's heart.
   4. If medical care is quick, leave band in place; otherwise, remove it after 30 minutes.
   5. Apply ice to site of sting.

Nose Injuries and Nosebleeds

A. Keep victim quiet.

B. Place victim in sitting position, leaning forward if possible or reclining with head and shoulders raised.

C. Apply pressure directly at the site of bleeding by pressing the bleeding nostril toward the midline.

D. Apply cold compresses to victim's nose and face.

E. If bleeding cannot be controlled by preceding measures, insert a small clean pad of gauze into nostril and apply pressure with thumb and index finger.

Open Wounds

A. Stop the bleeding immediately
   1. Direct pressure by hand over wound with compress.
   2. Elevate the injured part of the body above the level of victim's heart unless there is evidence of a fracture.
   3. If neither of the above methods work, put pressure on the supplying artery.

Eye Injuries

A. Foreign objects in the eye
   1. Keep victim from rubbing his eye.
   2. Wash your hands before examining eye.
   3. Pull down lower lid to examine.
   4. If the object lies on the inner surface, lift it gently with the corner of clean handkerchief or paper tissue. Never use dry cotton around the eye.
   5. If the object lies beneath the upper lid, grasp the lashes of the upper lid while victim looks down. Pull the upper lid forward and down over the lower lid.
   6. Flush the eye with water.

B. Injury of the eyelid
   1. Stop hemorrhage by gently applying direct pressure.
   2. Cleanse the wound and apply a sterile or clean dressing.
   3. Seek medical care without delay.
   4. Bruises above and below eye should be treated with cold applications.

Blisters

A. If all pressure can be relieved until the fluid is absorbed, blisters are best left unbroken. Otherwise, wash with soap and water and make a small puncture hole with sterilized needle.

B. Apply a sterile dressing and protect area from further irritation.

C. If blister has already broken, treat it as an open wound. Watch for signs of infection.

Fractures

A. Objectives of first aid for fractures
   1. Provide all necessary first aid care.
   2. To keep the broken bones and adjecent joints from moving.
   3. To give care for shock.

B. First aid principles
   1. Maintain open airway and give artificial respiration if indicated.
   2. To rescue if necessary, and to protect against further injury.
   3. To call for an ambulance.
   4. To prevent motion of the injured parts and the adjacent joints.
   5. Do not attempt to set a fracture or try to push a protruding bone end back.
   6. Lift and move an unconscious victim as though there is injury to his neck or spine.

C. If an open (or compound) fracture is evident or suspected, treat the wound as previously outlined
   1. Remove or cut away the victim's clothing.
   2. Control hemorrhage by applying pressure through a large clean dressing over wound.
   3. Do not wash the wound, do not probe it and do not insert your fingers into it.
   4. If a fragment of bone is protruding, cover the entire wound with a large, sterile bandage compress or pads.
   5. Do NOT replace bone fragments.

Sprains

Signs of sprain; swelling, tenderness, pain upon motion, discoloration are usually impossible to tell from a closed fracture without an x-ray.

1. If victim's ankle or knee is affected do not allow him to walk.
2. Loosen or remove the victim's shoes, apply a pillow or blanket splint and elevate leg, because swelling may produce greater disability than the original injury itself.
3. In mild sprains, keep the injured part raised for 24 hours. Do not soak in hot water.
4. Apply cold wet packs or small bag of ice. Do not pack the joint in ice and do not immerse in water that contains ice.

Swallowed Objects and Choking

The objective of first aid for a person who is choking is to allow the victim to assume a comfortable position and encourage him to cough. If breathing fails, administer artificial respiration and if necessary, attempt to expel the object. Obtain immediate medical attention.

Frostbite and Cold Exposure

A. Objectives of first aid are to prevent frozen area from further injury to warm the affected area rapidly and to maintain respiration

B. Procedure
   1. Cover the frozen part.
   2. Provide extra clothing blankets.
   3. Bring victim indoors.
   4. Give victim warm drink.
   5. Rewarm the frozen part quickly by immersing it in water that is warm, NOT HOT to the inner surface of your forearm.
   6. Do not rub the part.
   7. Do not apply heat lamp, hot water bottles or put part near stove or fire.
   8. Do not break blisters.
   9. Since severe swelling develops very rapidly after thawing, discontinue warming victim as soon as affected part becomes flushed.
   10. Once the affected part is rewarmed, have the victim exercise it.

AWARENESS ACTIVITIES

Blind Men and the Elephant

Objective: Sharpen the sense of touch.

Equipment: An object about the size of a walnut which has an interesting feel to it but will not too easily be recognized by touch. Suggestions: a fossil, a nut, a mineral crystal, etc.

Procedure: Have the group shut their eyes while standing in a line facing you. Pass an object around to all the members asking them (after all have examined it) to share what they think it is.

Discussion: Discuss the ways the students sought to identify the object, such as patterns in texture, weight, patterns in shape, temperature, etc.

Artist's Palette

Objective; To discover and emphasize the great variety and yet similarity of colors in their natural environment; to heighten the sense of sight.

Equipment: None

Procedure: Ask the group to form a tight circle with their backs facing in and their shoulders touching the person next to him. Ask them to count silently how many different colors or shades of colors they can see in 30 seconds. Give each person an opportunity to share their observations with each other. Ask which color seemed to come to mind first, second, third.

Best Outdoorsman

Objective: Sharpen the senses.

Procedure: The group sits in a semi-circle. In turn, each person mentions something he can see or hear, or smell, or feel from where he is sitting. No one can repeat what another has said. If he does repeat or cannot think of anything new, he moves out of the semi-circle. The one who stays in the game the longest is the Best Outdoorsman.

Variation: The group sits in a circle. Select a natural object (a leaf) and pass it from person to person having each one in turn mention something new about the object, that he can see, hear, feel, smell, touch or taste. Pass the object until only one person remains. No one can repeat what anyone else has said as in the other activity.

Sound Awareness

In a quiet spot off the trail let everybody sit down and be as quiet as possible, ask them to try to keep from rustling leaves and twigs, etc. Once they are quiet, ask them to close their eyes and listen for as many different sounds as possible. After about 15-30 seconds, ask them what sounds they heard.

Animal Locomotion

Ask the group to move from their present location to another one nearby. In so doing each person must use the type of movement of some animal other then man. You as the leader, must be the first one to take off - hopping, crawling, slithering, etc., and encourage the others to join in.

Trust Walk

This activity blocks out one sense thereby stimulating the other senses. Let each person pick a partner. One is blindfolded. The other person is the guide. They are to hold hands. The only communication they may have is hand-to-hand. The guide must "tell" his blindfolded partner where to go and what to do with hand motions only. You will lead the way for these pairs to follow. Lead them through an area where they must step over, under, through, and around obstacles. After a few minutes, let the partners switch roles and repeat the trust walk.

Variation: Make the time limit longer. Have them do the same thing except do not hold hands. This time the guide may talk the blindfolded one over a trail. Children must be aware of their responsibility in keeping their partner safe from harm. He is not to touch the blindfolded person unless he is in danger of falling or being injured.
This activity should be carefully supervised.

Blindfold Walk

Materials: blindfolds, pencils, paper

Procedure: Members of the group pair up with a partner. One person os each pair acts as a guide and recorder while his partner is blindfolded. The pair will reverse roles later. The guide leads his partner around the area and writes down the various sounds, smells, or even stimuli to the sense of touch (walking on the grass, dirt path, pavement, texture of tree bark, warmth of the sun, coolness of the shade, etc.) his partner identifies. Pairs should concentrate on one sense at a time, reversing roles before foing on to the next sense.

TOWN IN THE FOREST

Materials Required: None

Procedure: Have the students lie on their backs in a circle around the base of a tree with their heads next to the trunk, forming a sort of wagon wheel around the tree.

Help them compare the forest with an apartment house. What's at the very bottom? The basement (the soil is the forest's basement). What type of equipment goes down into the basement? Pipes, wire, heating plants, etc. (the roots of the trees and plants go down into the basement). What functions do these things perform? Carry in water, electricity, gas, and carrying out sewage (the roots perform the tasks of carrying nutrients and carrying down wastes). Pretend that you are the roots of a tree and dig your hands deep down into the ground and under the forest litter. How does it feel? Are there any signs of life down there?

What in the forest compares with the first floor of an apartment house, often called the lobby (ground level)? Most of the activity is at that level. Roll over onto your stomachs. What lives on the ground and up to one foot above it?

Roll over again. Look at the top floor. Who lives there? (birds, squirrels, etc.)
What forms the roof of the forest "apartment house"? What effects might it have on the things below? Look for patterns of light and dark in the forest.

How is the waste disposed of in the forest? Where are the sewage treatment plants? Look for fungi, molds, and insects that are carrying out the role of the decomposer.

Notice how all levels are interdependent.

HIKING

Materials Required: None

Procedure: Go over hiking rules.

1. Do not pick living things.
2. Do not tear branches and leaves, or otherwise mutilate trees and shrubs.
3. Do not litter.
4. Use all your senses and allow others to use theirs.

Types of Hikes:

Rainbow Hike. Object is to find and list as many colors in nature as possible. Good at anytime but especially after a rain.

Monogram Hike. Object is to find three or more nature objects beginning with your initials. Variation: Find objects that begin with each letter in your name, first, last or both depending on length of time.

Baby Hike. Object is to find first signs of babies of early spring.

Centimeter Hike. Object is to collect as many objects as possible that are one centimeter high, wide, round, long, etc. This hike should help the students notice the little, interesting things usually overlooked. Variation: Use a decimeter instead of a centimeter.

Stop, Look and Listen Hike. Object is to hike for five minutes or a designated number of steps. Stop for one minute and write down all objects you see or all sounds you hear. Five series of stops are enough for this hike.

Nature Hike. Object is to observe birds, insects, land animals, rocks and minerals, trees and shrubs, water animals and wild plants. Carry a magnifying glass for many surprises.

Hansel and Gretel Hike. See how many wild plants you can find that are edible. Would be great after the edible plant unit.

Hares and Hounds. Before the trail begins, decide on the material to be used, such as acorns, pebbles, leaves or nuts, etc. Two children are appointed as Hares and they fill their pockets or a bag with the chosen material. After 5 minutes the Hounds try to follow the trail laid by the Hares.

Sense Hike. Feel - bark of trees, animals, insects, plants and weeds.
Taste - sassafrass bark, spice bush, oak and hickory bark.
Listen - to the wind, birds, animals, etc.
Smell - flowers, weeds, grasses, etc.
Do not touch toadstools, ivy, mushrooms, and jack-in-the-pulpit root.

Tracking and Trailing. One group leaves first and lays a trail with stones, sticks, or signs, and the other group tracks them down.

Alphabet Hike. Look for objects beginning with each letter.

Miscellaneous Hike. Gather leaves for crayon or spatter prints,; weeds to paint in the fall; material for bughouse, rocks stones.

Onion Trail. Rub a cut onion on trees to mark a trail. Followers smell the tree.

Rainy Day Hike. Watch where the water goes after a rain or during if it is not lightning.

Blindfold Hike. Used to sharpen the senses and develop an appreciation for the unity in the forest community.

Equipment: Approximately 50 feet of rope and a clean blindfold for each person.

Procedure: As you blindfold the students, explain that they will follow a long rope and that they should not talk but listen to the sounds of the forest, smell its odors, and feel its floor with their feet as they walk along. Point out that often people who lose the use of one of their senses compensate by increasing the sensitivity of their others. Occasionally instruct them to stop and listen, then proceed as before. At the end of the walk have them sit in a circle and share what they thought about as they walked through the forest. Leave the blindfolds on.

Have the students reach down and pick up a handful of the forest litter. They are to smell and feel it. Ask them to compare their perceptions to objects they are familiar with. How many different names for smells can they remember?

ENVIRONMENTAL PROJECTS AND ACTIVITIES

I. Objectives of a camp ecology program:
   A. To develop an awareness of, and knowledge about, one's environment: both at camp and of his home community.
   B. To develop an ecological consciousness; that is, an understanding of the meaning of ecology, how eco-systems function, and of mans relation to the world.
   C. To develop a sensitivity to factors that constitute a desirable environment in which to live, both at camp and home, and to create a sense of urgency for correcting environmental problems through ecologically sound actions.
   D. To develop a familiarity with the natural history of the camp environment.

II. Responsibilities of a camp ecology counselor:
   A. Developing an ecology program for campers that will stress environmental awareness, concern, commitment, and action.
   B. Consulting with the camp director about the impact of the camps operation upon the environment.
   C. Discussing with the camp director and staff members changes in specific camp policies or operational procedures which are incompatible with enhancing a quality environment.
   D. Securing the necessary equipment and supplies for implementation of the camp ecology program.
   E. Interpreting the camp ecology program to community, parents, and campers.

III. Camp ecology training model:
   The structure of the model is simple. Just ask yourself these five questions:
      1. What am I trying to do?
      2. What methods can I apply?
      3. Where can I do it?
      4. What equipment or supplies do I have or need?
      5. What outside resources are available?
   Using these questions, an outlined structure follows easily. This is the skeleton of the model which actually can be applied to any camp function or activity.
      I. Identify goals and objectives for your program.
      II. What activities can you use to support the program goals and objectives.
      III. Identify the area layout (graphic map and inventory the areas available to the camp.
      IV. Inventory the available supplies and equipment, also the facilities that can be used.
      V. Invertory and list all possible supplies resources, published and unpublished, camp staff, agencies and organizations, local residents, state and fedreal services and departments and industry.

VI.. Establish a method of review and revision to keep the program current and relevant to present concerns. Also provide a system to record what has been done so in following years the program will have a identifiable hi history to serve as a guide for future staff.

I. Statement of Purpose, General Goals and Objectives

Although terminology is not consistent we can select quotations that will help this statement:

"Environmental education is aimed at producing a citizenry that is knowledgeable concerning its biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work toward their solution." -- William B. Stapp, et all. Department of Resource Planning and Conservation. U. of Michigan

"Environmental education is the process of recognizing and clarifying the VALUES, ATTITUDES and CONCEPTS necessary to understanding and appreciate the interrelatedness among MAN, his culture, and his biophysical environment. Environmental education, moreover, entails practice in decision-making about issues concerning environmental quality." --B. Ray Horn Department of Outdoor Education, Northern Illinois University.

These statements on environmental education can be drawn to these main goals.

1. develop an AWARENESS of one's environmental education both at camp and home.
2. Develop an ecological consciousness; that is, an understanding of MEANING OF ECOLOGY , how eco-systems function, and of man's relationship to them.
3. Develop a sensitivity to factors that constitute a desirable environment in which to live, both at camp and home, to create a SENSE OF URGENCY FOR CORRECTION in environmental problems. A realization of environmental quality.
4. Develop a familiarity with the natural history of the camp environment.

Briefly:

1. Environmental awareness
2. The meaning of ecology
3. Environmental action
4. Natural history .

The next phase is to identify more specific sub-goals that relate to your major goals. List sub-goals and then relate t them to your major goals. You might use the form shown below.

List sub-goals for each of your major areas, and at this point it might be useful to do these on separate pages. Later you will identify programs and activities for each area. If these are on the bottom or back of the pages with the goals they relate to, it will provide a quick and handy reference as to how everything interrelates.

The use of the following outline may expedite your planning and make it easier to use when you are actually in the program. It will also be a valuable aid to any substitute who might fill in during your absence form the program.

MAJOR GOALS	SUBGOALS AND OBJECTIVES
ENVIRONMENTAL AWARENESS	1. Develop a sensory awareness and appreciation of the environment in which we live with both campers and staff. 2. Create an atmosphere which will encourage the participant to expand his understanding of ecology. 3. Instill a sense of kinship with the natural world.

Suggested program activities:
1. Blind hike through a climax forest.
2. Lying on ground, examine a 2" square plot with a hand lense.
3. Instill a sense of kinship with the natural world.

T

Meaning of Ecology	1. Develop an understanding of the basic ecological concepts, such as: inter-dependence — succession carrying capacity — food chain material cycling — web of life communities/habitats — energy flow eco-systems — adaptations life cycles — diversity 2. Investigate and assess man's place in, and impact upon the total eco-system.

Suggested activities:
1. Have campers design and construct a terrarium
2. How many can you fit on stump?
3. Observe and list the traffix patterns in camp, people, aminals. What has happened?

II. Develop a series of activities that would support your major concepts and list them on the same sheet or attach then to the sheet. The ideas are endless and many resources for activities are readily available. The main point here is to figure out what you are going to do and where it applies. You will find some activities cover many objectives, some, just a few. You can zero in on specific concerns, but this whole approach, as organized or structured as it may seem, gives an indication of just how balanced your programming is and an "easy to refer to" guide for someone who is new to this type of programming.

Explanation of the activites should accompany this acitvites including:

1. the Activity
2. The area
3. Materials needed
4. Activity cantent and method
5. Minimum and maximum number of participants including leadership
6. Any other special arrangements.

III. Inventory the areas which are available to the camp. Map and desctibe these areas and indicate where they can be found. Maps and overlays can be used to identify:

1. Camp boundaries
2. Unique natural areas(bogs, lakes, climax forests,etc)
3. Camp buildings and foot paths.
4. Animal habitats and sighting locations
5. Unique features of the area used in tripping.

IV. Inventory the available natural equipment you have on hand and list additional items you can expect to secure. This gives you an idea of what you have to work with. In addition to identifying your equipment, you should indicate areas you could use as a nature center or work areas. You might include some diagrams for sample layouts or a series of changing layouts for variety and interest.

V. Make a reference list of as many resources as you can:

1. Unpublished and published material
2. Federal and state, local agencies and services
3. People--- camp staff, local.
4. Industry (local paper companies)
5. Libraries, film services

Annotate the reference list to indicate how it can be used in your planning and where it can be found. Remember some of these referencer will require advanced planning to get. Don't let yourself get caught short by waiting to secure them until the beginning of your camp session.

VI. Review and Evaluation could well be the most important part of your planning but often they are treated very lightly. They should require special attention and effort. It is important that you establish a method of review and revision to keep your program current, interesting

and relevant to present concerns.
Structured forms and review outlines have their place, but they can never be the sole instrument for planning for the future . The key to it is attitude and enthusiasm the director or camp ecologist carrier into her approach in making a program review. Too often the problem of evaluation(as well as designing and implementing) a nature program is thrown upon the nature specialist without any mention of direction or guidance, just a simple, "do what you want".
There is no argument with delegation of responsibilities. A learn by doing approach is the key to most education. When a situation develops where there is no direction, consulation or guidance, everyone suffers unless the nature person has a great deal of ability and can tie things together. Often this is not the case. There is a need for everyone in the camp programming to have a hand in planning and evaluation because everyone is affected by it. It is true that some will not have direct contact with the nature program, but they are a part of the camp and they should share in the planning. Have you ever seen a hike cut short due to other program scheduling? Here is not a plea for any one area to override another but just a need for inter-communication and cooperative planning so everything runs smoothly. The director should head the thought review in light of the original goals and objectives of both the camp and the nature program. Informal meetings, rap sessions, the ability to try something new if something doesn't work, and keys to making the program go and grow.
Here are some things to consider:

1. How balanced is the program? Did you cover the major areas evenly?
2. What activities worked well? What are group and what size?
3. What activities didn't work? What age group and what size? Any particular conditions?
4. Did you use your resources effictively? What ones did you use the most? Least? which could be used more often?
5. What special problems were encountered?
6. What new things were tried? What worked and didn't?
7. What recommendations can be made for next year?

The questions asked in review should be directed to what you achieved, what affects did it have and what can be done to make the program better. It is also a method of keeping a history of what the program has done.. This is helpful for planning in the future.
Probably the best way to pull it all together is in a large three ring notebook so additions and deletions can be made easily. The notebook should be given to the eco-counselor proir to camp, giving him/her a chance to review and begin to plan. Also the structure and organization should be simple enough for someone else to pick

up the book and get a felling for the scope and approach to the nature program. Consider the old farmer's philosophy as it is applied to environmental education programs,"he like the simple and natural things, dedicated to making things grow." Let's provide a climate and resource, the encouragement and equipment and allow rapid growth of understanding, interest and action.

II. Things to do

A. One Hundred Inch Hike:

Objectives: After the activity the student will be able to:

1) Explain or give examples of the difference between observations and inferences.
2) List two examples of animals which have body coloration that protect them in their habitat.

Materials: Hand lenses

Description: The activity will begin in the feild. Have the children form a circle, then explain to them they are going on a very special kind of hike. On this hike, they will take the role of a very small animal living in the field and will be trying to find other animals in the area. Then have the students form a straight line and get down on their hands and knees(unless it is too muddy) and crawl very slowly through the grass or over the ground. When something is found, have everyone stop and look at it. Discuss what kind of body covering it has--shape, texture, color. Does it have legs? Can it fly? Was it easy to spot in the place it was found? Look for pieces of dead or decaying plants and animals. Discuss the possibility of how pill bugs and bacteria and worms might be helpful in the process of decay. Look for animals that are feeding on the plants. Try to find out how the animals breathe. After traveling 100 inches in one type of area, go to another type and begin again. Make comparisons. Discuss what inferences could be made based on the observations collected.

B. Tooth pick hunt:

Objectives: by the end of the activity, the student will be able to suggest appropriate colors and/or markings for animals living in the environment and explain in terms of predator-prey relationships when presented with a colored or patterened background(habitat).

Materials: 400 colored toothpicks, 100 ech of brown, red, orange and green.

Description: Scatter exactly 400 toothpicks over a grassy area before the activity is to begin. Have the students assemble and discuss with them that they will be looking for differently colored toothpicks. They do this for two minutes. Stop them and collect all the toothpicks that they have been collecting. Have them continue to look for the toothpicks for a few more minutes. Discuss what numbers were found and why there where varying amounts after each period. After this have them suggest some hypothesis to explain the results. Let them select the hypothesis the would like to test. Have them develop on "if....then..." statement. (For example if a caterpiller is green then we should find it an a green leaf: if we look in a specifically colored or patterened areas, then we will find only organisms that match that area and they won't be easy to see at first.) This is the procedure could be carried to a new environmental

setting; for example, scatter toothpicks under a pine tree. Follow up the toothpick hike and hypotheses with an animal color hunt(100" hike). Have the students collect observations that will support or oppose their hypothesis. Near the end of time period have the children present their observations and discuss whether their hypothesis was supported or not. Have them carefully look at the data and note whether there are any discrepant pieces of information. Have them modify their hypothesis or develop a new one that will fit all of their data.

C. Studying a pond community:
Equipment: magnifying glass, strainers with long handles, small bowls, reference books, insect nets.
Location:: select a place with some vegetation. Natural barriers would prevent running all around the pond. Shallow water. Steep bank. Board walk would keep grass from being trampled and allow sampleing of deeper water.
Procedure: 1) Make sure you have all the equipment.
2) prepare campers for what they will find, ie tiny organisms as opposed to frogs or fish
3) Let them explore with strainers dump anything interesting in bowls for observation.
4) Caution against stirring up the mud.
5) Be aware of sounds: frogs, crickets, etc.
Data: snails, larvae, copulating dragonflies, tadpoles, etc.

D. Magic Number Game:
Make statements about natural objects the leader has talked about. Give different value(odd numbers good) for true and fals Number stations so kids do not all start at the same place. Add numbers for total magic number is the correct total. Review and correct.

E. Study of communities:
Objectives:Not to collect data on characteristic of different areas, but to contrast the areas pointing out similarities and differences.
Areas: Run experiments in five areas such as a lawn, an old field, a thicket, a yound woods and a mature woods.
Materials: buckets, small can, two thermometers, several hoops made from coat hangers, shovel, ruler.
Procedure: Plant variety- hoops are thrown at random over area and the number of palnt types within the hoops is recorded.
Temperature: recadings are taken from a thermometer in the sun and from one in the shade at each location.
Water absorbtion: small can is pounded firmly in the ground and filled with water. See how long it takes to drain.

Roots: using a shovel, dig a hole, observe roots, soil, etc., replace sod. Also measure length of roots and above ground growth.
Other experiments: Collect soil sample of each area. Compare the colors. Weigh the soil samples. Dry them and reweigh. to test for light intensity, use blueprint paper squares. In brighter places the squares will be more exposed.

F. Survival Simulations:
Objectives: By the end of the activity the camper will be able to: List the three essential needs a person must satisfy in order to survive(food, warmth, water). Name or describe at least two sources or means of obtaining water, food, and warmth in the wilderness.
Materials: Matches, poncho, twine, pocket knives, trash can liners, shovel, clorox, topo map, campass.
Description: The activity will begin with a short discussion led indoors by a member of the resource staff. Each group will then be led by its counselor to a place in the woods where the lodge cannot be seen. At this place the counselor will anounce to the campers that they are lost. The group will discuss what they should do in order to survive... how they will get water, food and warmth, and who will be responsible for obtaining these things. Each person will and should then fulfill his responsibilities. When these things are done, the counselor and the group should sit down and discuss the ways in which they got what they needed and how they might have done things differently. Following this, the students will use the map and compass to find the direction and return to the lodge.

G. Eco-discovery:
Idea: to discover the delicate balance of life and the living system that surround us...always
Materials: Half gallon milk cartons, spray paint, string, 35 mm film capsules.
How to: Locate eco-discovery capsules whenever you would like to stress a relationship or idea. Use the capsule to tie together different programs, orientate campers to the habitats of the area by using an eco-discovery course. Let your imagination take over. Be as creative as you like. Let your mind fashion its own eco-trip.

H. Plastic Environment:
Idea: How plastic is our environment? Are we sensitive enough to the simple yet complex things that surround us everyday to interpret the interrelationships that may have definite effects on the quality of our lives.
Materials: 20d or larger prescription vials.
How to: Have your group collect 5 articles in the outdoors that they feel are a special interest to them. Are the 5 items related to each other in any way? How are they interrlated in our eco-

system? Have the students interact on the reasons for bringing things. Discuss relationships.

I. Color and Shape cards:
Idea: To heighten our awareness our awareness of the variations in color and patterns of nature. Colors and shapes are somtimes hidden. Let's see what was can find!
Materials: Construction paper pieces 3x3 a varity of colors. White 3x3 cards which might have concentric circles, spirals rectangles, etc.
How to: Give one card to each person and some time to find something in nature that will match the color and shape found on the card. Return and discuss what you found.

J. Camp earth day:
Idea: Have an earth day if possible every session. A great way to foster undersranding, interest and involvement in the improvement of the environment.
Materials: Depends on the program.
How to: Earth days can offer a variety of programs, each programmed to meet the needs of the individual camp. It should be a special day a planned for in advance, devoted to activities which would increase environmental awareness, appreciation of the environment, and a chance for campers to work together for their environment.
Some suggested activities: Ecology Plays;(nov. 1973 issue of Ranger Rick has good example)
Special Projects: Inprovement of the camp environment. Song and dance or creative Drama: Utilizing the earth day theme. Carnival: complete with sideshow and barker, See a mini world in its entirity(sealed Terrariums made by the campers, or worlds most distructive animal(box with mirror). Use of ideas in Things to do section in ACCLIMATIZATION, particular use of senses by developind a sense booth, chorcoal drawing or mural booths.

III. Action Socialization Experience (ASE)

A. Purpose: An ASE is a problem-solving situation which stimulated immediate participation in a small group activity. These experiences provide opportunities for small groups of students to cooperatively decide on a soultion to a carefully designed problem and carry out their plan of action quickly and efficion as possible. As a result, the students self-confdence and pride is bolstered on the immediate and successful completion of the tasks.

B. Mechanics: At the ASE site, each group will go to a different station. At his group's station, the counselor-teacher will explain the set up and the objectives for the task at that station. The group will then be given fifteen minutes to complete the task, after which the students will go to another station. The counselor-teacher should be sure to emphasize to the group the importance of working cooperatively toward the completion of the task within the allowed time.

C. ASE activitys:

1. Electric Fence:
   Equipment: a 15 foot length of rope any diameter, trees-8-10 feet apart, 4-6 inch in diameter log, 5 feet long.
   Set-up: Tie the ropes between two trees at a height of three feet(higher for older children and adults) to simulate a fence. On the ground, mark boundary lines parallel to and five feet from each side of the rope.
   Object: To get the entire group over the fence without touching it in any way. Should anyone touch the fence the whole group must start over. Once over the fence, a person cannot walk around the trees to come back and help others over.
   Safety Procedures: Spotters should stand on the side of the rope opposite where the students are jumping. Students who have gone over the fence may do this. Students who have not yet gone over should spot from behind.

2. Team on a T-shirt:
   Equipment: One T*shirt or smaller piece of cloth depending on group size.
   Set-up: Place T*shirt on the ground in relatively open area.
   Object: To get everyone standing on the T-shirt for at least ten seconds at one time so that no one is touching the ground except with the foot or feet that also touchs the T-shirt. This activity can be used to demonstrate the concept of carrying capacity.

3. Island in the Quicksand:
   Equipment: one 20-foot lenght of rope, 1-inch diameter; one 10-foot lenght of rope, ½inch in diameter; one 5-foot lenght of rope, 6 inches in diameter: one large tree with sturdy branches 20 feet above the ground.

Set-up: Suspend the 1-inch rope from the branch of the tree Vigorously swing the rope several times to determine the maximum arc and boundary lines at the extremes. Place the ½-inch rope and the 5-foot long log behind the boundaries.
Object: To get all members of the group and the log across the quicksand(space between the boundaries) without touching the sand. If anyone touches the sand, everything must be brought back and placed as it was set up and the group must begin again.
Safety Procedures: Spotters should be strategically placed to prevent anyone from swinging into a tree. No one should be premitted to tie himself to the swinging rope.

4. Beam:
Equipment: one 12-inch in diameter log, 10 feet long: two sturdy trees, 6-8 feet apart;
Set-up: Securely lash the log between the trees so that the bottom of the log is 5 to 6 feet above the ground. Make boundary lines parallel to and five feet from each side of the log.
Object: To get each member of the group from one boundary line, over the beam and across the other line as quickly as possible. If the trees supporting the beams are touched the entire group must begin again.
Saftey Procedures: Students should stay clear of the landing area to avaid being jumped on. Spotters should be posted and soft shoes should be worn.

5. Maze:
Equipment: 300 feet of binder's twine or light rope, one blindfold for each group member, a small grove of trees reasonably close together.
Set-up: String the rope through the trees at waist level in a zig-zag pattern to make a maze. Leave a small space between two trees as an exit. Blindfold all members of the group a short distance from the maze. Have them hold hands and lead them in to one corner of the maze.
Object: To find the exit to the maze in the shortest time possible. Once a person is outside, he may remove his blindfold and verbally direct the others to the exit.
Safety Procedures: The ground within the maze should be as free from rocks and other obstacles as possible.

6. Stretcher Case:
Equipment: two 1 to 1½inch diameter poles, 6-7 feet long.
Object: To make a stretcher using available materials, and transport a victim over a series of obstacles to be determined by the site. The victim is presumed to be unconscious and thus connot hold onto the logs.
Safety Procedures: Care should be taken to insure that the victim in the stretcher is not dropped.

7. Making a filter system:
Materials needed: one plastic milk bottle, a small bag of sand(enough to put 1½inch in bottom of bottle), a small bag of crushed stones about ¼inch across, a small bag of aquarium gravel.
Procedure: ut off the top of the milk bottle. Punch holes about every inch or so around the bottom of the bottle. Put 1½ inch of sand, 1½ inch of gravel and 1½ inch of stone. Place the filter in a collecting pan(anything will serve that will hold the water once it has passed through the filter). Take some water from the tap and put dirt or soil in it. Stir until well mixed and pour slowly in the top of the filter. Repeat this until the water level in the filter reaches the top of the gravel and allow the water to seep slowly through the filter medium. It may be n necessary to repunch the holes from time to time if the water does not flow.
Ask These Questions: What happened to the dirt that was in the water? Would you be satified to have this water go back through a stream or river after filtration? How much sand and gravel might it take to filter all of our waste water? What would happen if was just dumped dirty water into our rivers and streams?
NOTE::: It is important to point out to children that this is just one example to man's effect on one resource a and that man has an effect on each resource he uses. These effects are usually quantitative and qualitative.

8. Instant Nature Trail:
This is best set up along a usual camp route, not in a special separate area. The leader stops at points of interest along the path discussing trees, animals, etc. The next day the children are given baggage tags (one each) with information talked about the day before which they must place at the right station on the path. Some hinting might be necessary. If the group arrives at the end of the path and tags are left, use them on the trip back. Tags can be dipped in paraffin to weatherproof them. Not much identifaction for kids younger than 4th or 5th grade. If kids really want to know what the trees are, they may take the tree's fingerprints (ribbing or clay cast of bark), Look it up with leaves, etc., Add names to back of cards. Do not leave up too long; learning is in the process of setting up.

9. Find a rock:
Each child finds a rock that he can identify with and described it ot the group. This can tell a great deal about personalities. Good get aquainted game also.

10. Howling and Hooting:
This activity helps instill a fondness for predators. One can gain great insight form association with predators and gain skills in interpreting body English, threats, communication among animals such as calling young, mating calls, and territorial calls. Great Horned Owl* series of hoots on some note, irregularly spaced. Barred Owl- (mating) Hoo, hoo, hooo, hooo, Ah. Wolves call to maintain territory of a pack and because they enjoy it. For people, wolf calls are a great release activity. Get together and howl. Wolves howl on different notes- yap yap and howwoowwoo.

11. Tree planting:
Trees are often available from state forestry departments. Have children take seedlings and plant them where they want Each child can make a map of HIS/HER tree. Maps are filed at camp and are given to the camper the next year. He may then visit his/her tree. The children and trees have a positive reaction to this activity. Exotic species can take over an area so it is best to plant native trees.

12. Web of Life:
Eight people sit in a circle and each person is assigned to a role and holds seven pieces of yarn of the color representing his part. Woodland creature(brown), Man (Red), wayer(blue), Air (white), soil(Black), light(orange) Insects(yellow) and vegetation (Green). Each person gives one of his strings to every person he depends on. This will form a web. Children will notice that man depends on all of these things, yet very few things depend on man. This activity might also suggest a discussion of "what might happen" if the water became polluted, Etc.

13. Plan et Hike:
Using a scale of 1 millimeter=9,3000 miles, set up our solar system by starting from a point(the sun) and have one person stand in the position of each planet. The group can the walk fo each planet and get acquainted (the person might give a few facts about the planet he represents.) Geo-drama: children act out geologic history Play the parts of the young molten earth becoming the form we now know.

D. Sensitivity Activitys:

1. Apple Toss:
Group stands or sits in a circle and tosses an apple. to toss the apple you must call by name the person to which you are throwing it to. Helps a group learn names painlessly. A variation is an Imaginary toss, pantomine tossing item. ie feather, bowling ball etc.

2. Name tags:
Using magazine pictures and words, make a name tag which will introduce yourself to the group.

3. Paper cup game:
Using a paper cup. Each person in the circle can call the cup anything he wants. For example, the cup may be a disliked rule, Each person takes out his hostilities on the cup and then passes it on to the next person who renames the cup and does the same .

4. Magic Box:
Each person the group takes his/her turn going to the box and taking out the one thing that means the most to him in the world. He then nonverbally tries to communicate what the thing is to the other members of the group. however, the group does not try to guess, nor does the person tell what his thing is. This is probably not a good activity early in a groups life.

5. Role Play Situations:
Take an ecology problem and each person take the part of a concerened citizen such as a land owner, teacher, soil conservation man, builder, etc. Discuss the problem taking the opinion which would by held by the part you are playing rather than your own. Switch roles so each person can see different sides to the question. Try to come up with a considered opinion and try not to become too emotional.

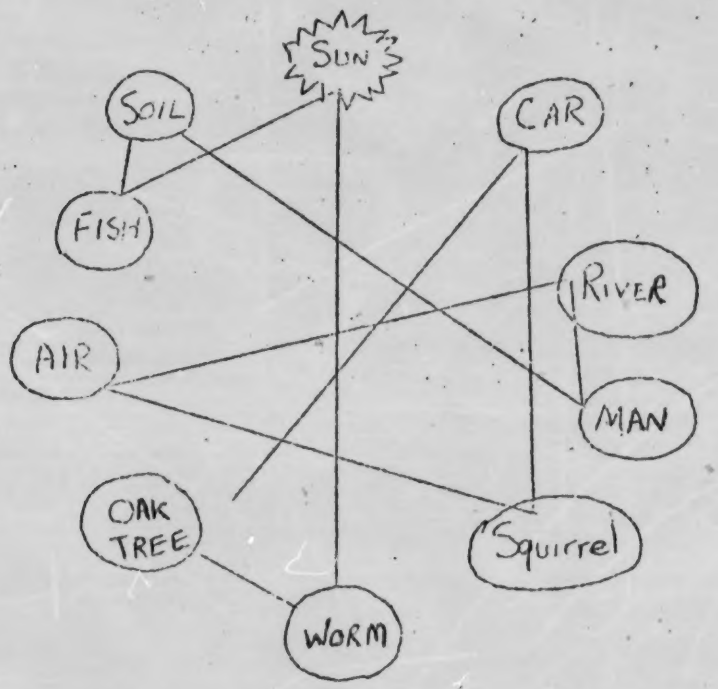
6. Earth?
1 apple = 1 earth. Cut theapple. 1/4 is all the land forms of the world. The earth is 3/4 water. From this 1/4 cut it into 8 parts. Each part represents various land forms;2/8=desert
1/8=mountains
1/8=forest
1/8=tundra
1/8=marsh, swamps, and bogs.
1/8=lakes,rivers,glaciers - very polluated
1/8=farm land-which was are paving over and turning into cities.
Eat a portion, can you defend your choice.

THE WEB OF LIFE (7-15 players)

Purpose: To illustrate how plants and animals (including man) are dependent upon each other and upon the environment (sun, air, water and soil) for survival through a "web" of inter-relationships, and what happens if the web is damaged.

Materials Needed: Ball of string, marking pens or crayon, "name" cards (4" x 12"), scissors

Description: Players form a circle. Each player is given a name card which identifies him as some part of the environment, such as the sun, air, water, foil, different types of plants and animals, and man (and man-made things such as cars, houses, factories, etc.). The leader begins by asking the "sun" to hold the end of a string and then unwinds the string from one player to the next, crisscrossing back and forth across the circle. As each player is connected, ask the group why a connection is important in the environment. For example, how is a tree "connected" to the sun (or dependent upon the sun), how is man connected to the tree, and so on. Any two players can be connected. Be sure to unwind the string in one continuous strand, don't cut it after connecting the players. Connect all players to at least one other player. After the connections have been made, the string will form a "web" which connects all major parts of the "environment" as shown in the diagram below. The leader then cuts the string between any two players and asks the group what will happen to the web. of life now that a connection has been broken. Follow the cut string from one player to another, showing how one broken strand can affect everything in the web since all are connected to one another. Eventually the connections lead back to the sun,, the source of energy for all life.

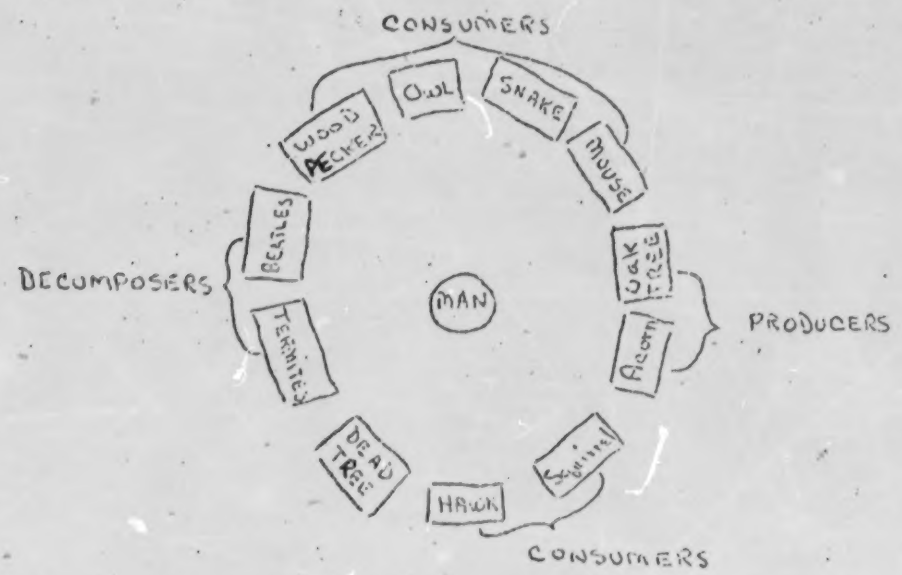


THE FOOD CHAIN (10-12 players)

Purpose: To discover how plants and animals form a food chain of producers, consumers, and decomposers and what happens when the food chain is upset.

Materials Needed: "Name" cards (4" x 12")

Description: Players form a circle as shown in the diagram below. Each player is given a name card identifying him as a certain kind of animal or plant. The leader stands in the middle with the name card "man" and, starting with the plant, asks each player to hold hands with the player on his left. As each player holds hands, ask the group how these two "parts of the environment" are connected (or dependent upon each other). After all players are holding hands ask them to lean backwards as far as they can without falling over. Then, without warning, the leader rushes through the group between two players, breaking their handhold. (Be careful not to rush through too fast as you might break something else besides their handholds!) Once the handhold is broken, the group tumbles over backwards, showing how the entire food chain was unbalanced when one link was broken. Ask the group why this might happen in the environment when a link in the food chain is broken. Be prepared to form another food chain and break another link, and another...and another!



An oak tree produces acorns. A squirrel lives in the oak tree and eats acorns. A hawk catches the squirrel and eats it while perching by its nest in a dead tree. Beetles are beginning to eat (decompose) the dead tree. Termites continue to break down the wood further. A woodpecker eats the termites and beetles, and makes a hole in the tree. An owl uses the hole for a home, and eats a snake which has eaten a mouse which has gnawed the bark and acorns of the oak tree.

Specific Objective: Forest Study Using the Senses

Objectives:

Students will demonstrate an increase in their awareness of the aesthetic value of forest areas by using their five senses to explore the forest area.

Students will actively participate in the awareness exercise to develop a sensitization to the forest environment.

Learning Activity

This activity may best be done on a trail by: spacing children along the trail apart but within seeing distance of each other.

Material: none

General Survey

What are our five senses? Can we use them to study the forest?

Sight -
What do you see the most of? Are these things you see the only living things in the forest? What other things could live in the forest? Do you see their homes? Describe everything you see.

Hearing -
While on a trail take a silent hike. Do you hear any sound or sounds in the forest? Describe the sounds. What or who is making these sounds?

Feeling -
What do you feel as you stand in the forest? Describe what it is you feel? What do the trees feel like? What do their leaves feel like? Do all trees feel the same? What do the bushes feel like? What does the ground feel like? Describe all the feelings you are getting.

Smell -
Does the forest have any odors? Do the trees have any odors? The bushes, do they have any odors? The leaves, do they have any odor? Does the ground have an odor? What makes the ground smell the way as it does?

Taste -
There are many things in the forest that can be tasted but use caution when doing so. Be sure you know the plant!

Evaluation

Self-evaluation: the student could be asked to compare the way he felt about the forest before doing this exercise and after doing this exercise.

COOKING IN THE OUTDOORS

The following section includes lessons on planning the experience, fire building, and receipes that can be used in the outdoor and which can easily be prepared by children in the sixth grade.

It is also recommended that some of the edible plants from the area be included in the meals the students prepare.

FIRE BUILDING

Materials Needed:

1. Matches or lighter in a waterproof container
2. Saw
3. Tinder; materials that flare up when burning such as wood shavings, dried weeds and leaves, bark, or tissue paper
4. Kindling; small twigs or branches on trees that have died. This is called squaw wood and should snap when you bend it
5. Fuel; dead wood found near your campsite, cut into lengths of 10" to 12"
6. Spade
7. Water bucket

Proceedure:

If a fire area or fire ring is not provided clear the leaves, pine needles and dead grass in a circular area about 10' in diameter. This cleared area should be at least 10' from the nearest tree.

Within the center of this circle turn the earth with your spade. This should be directly beneath the fire and serve as a base. Border this base with rocks or small stones. (All of these materials are to be replaced when fire is extinguished by burying the fire in turned earth and pouring water on it.)

When your fire ring is prepared, gather your fuel. Saw any large pieces of wood into smaller lengths. Store all the fuel away from the fire ring in a place that can be protected from rain.

Put the tender beneath the kindling and ignite the tender first. When the kindling is burning well add larger pieces of wood.

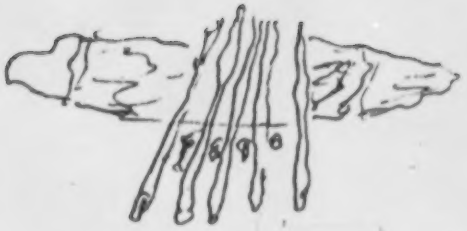
Regulate the size of the fire by limiting the amount of wood you put on the fire. A good cooking fire comes from glowing embers. If the fire becomes too large it is difficult to work with.

Four Basic Types of Fires

Tepee

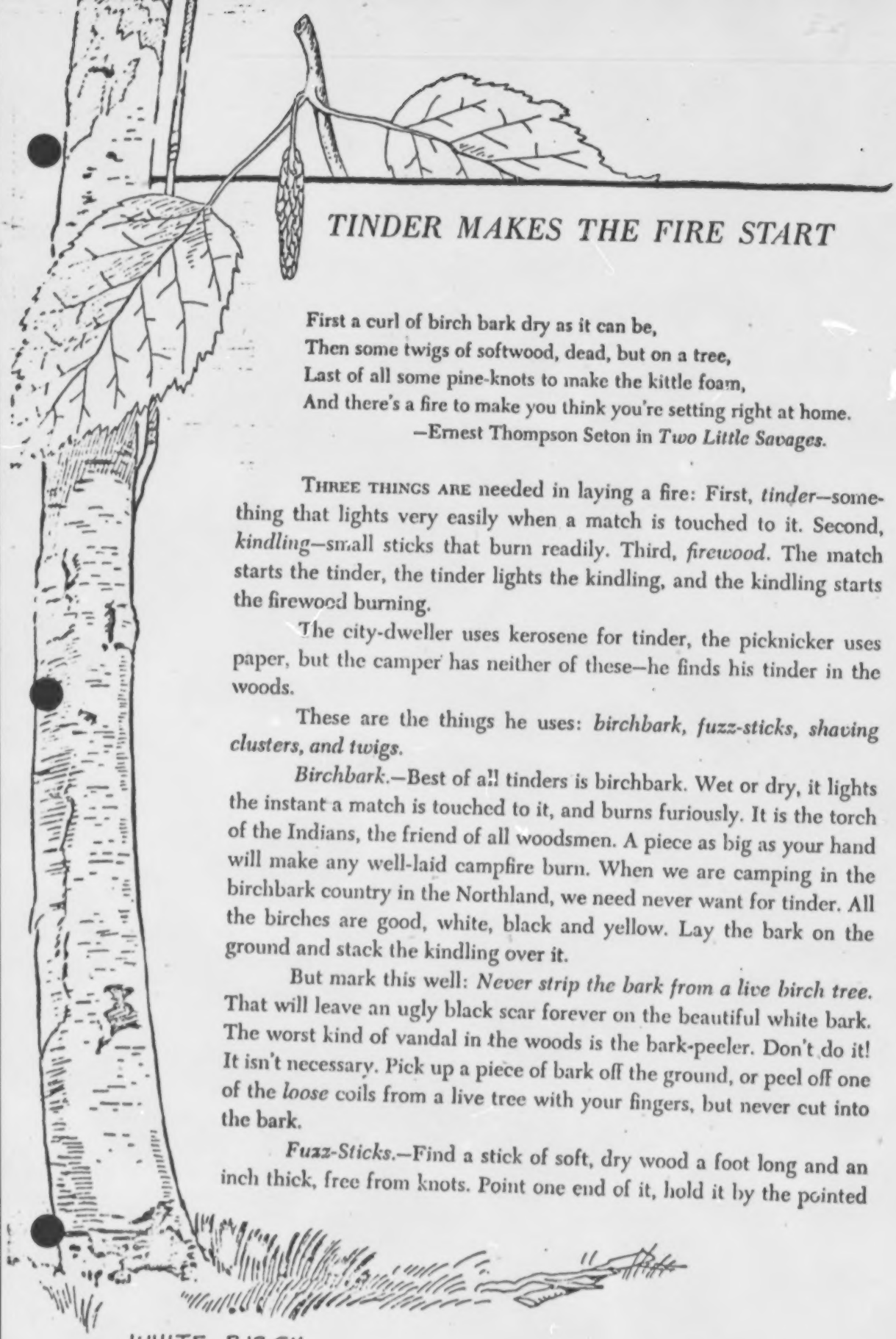
Lean-To

Criss Cross



Fire Stick

These are the four common ways of placing the tinder and kindling to start the fire.



TINDER MAKES THE FIRE START

First a curl of birch bark dry as it can be,
Then some twigs of softwood, dead, but on a tree,
Last of all some pine-knots to make the kittle foam,
And there's a fire to make you think you're setting right at home.
—Ernest Thompson Seton in *Two Little Savages.*

THREE THINGS ARE needed in laying a fire: First, *tinder*—something that lights very easily when a match is touched to it. Second, *kindling*—small sticks that burn readily. Third, *firewood*. The match starts the tinder, the tinder lights the kindling, and the kindling starts the firewood burning.

The city-dweller uses kerosene for tinder, the picknicker uses paper, but the camper has neither of these—he finds his tinder in the woods.

These are the things he uses: *birchbark, fuzz-sticks, shaving clusters, and twigs.*

Birchbark.—Best of all tinders is birchbark. Wet or dry, it lights the instant a match is touched to it, and burns furiously. It is the torch of the Indians, the friend of all woodsmen. A piece as big as your hand will make any well-laid campfire burn. When we are camping in the birchbark country in the Northland, we need never want for tinder. All the birches are good, white, black and yellow. Lay the bark on the ground and stack the kindling over it.

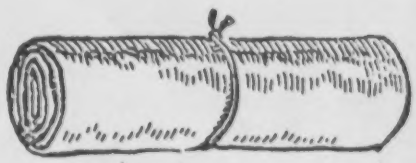
But mark this well: *Never strip the bark from a live birch tree.* That will leave an ugly black scar forever on the beautiful white bark. The worst kind of vandal in the woods is the bark-peeler. Don't do it! It isn't necessary. Pick up a piece of bark off the ground, or peel off one of the *loose* coils from a live tree with your fingers, but never cut into the bark.

Fuzz-Sticks.—Find a stick of soft, dry wood a foot long and an inch thick, free from knots. Point one end of it, hold it by the pointed

WHITE BIRCH

SURE FIRE WITH TRENCH CANDLES

MAKING FIRE IN the rain? It's no joke, believe me. Even the best of woodsmen find it hard, and the best sometimes fail. That is why the seasoned old-timer who has been through many a gale and cloudburst, and knows well the hazards, always goes prepared with trench candles or other artificial tinder that means sure fire, come what may. The trench candles we make ourselves and carry along. It's a grand feeling to have them in the pack, for let Nature do her worst, we know we'll always have fire. It is foolhardy to go without them.

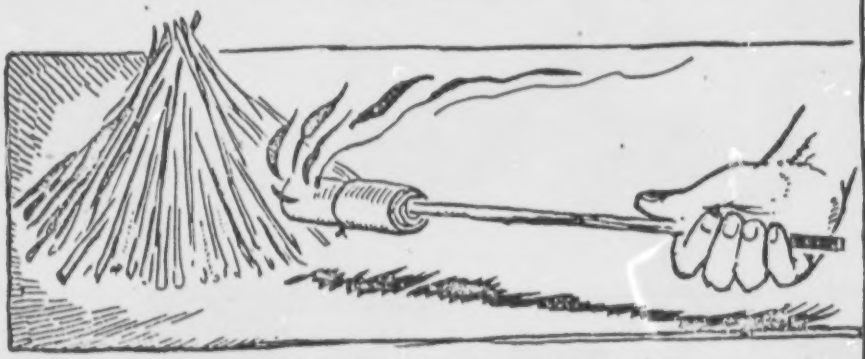


Roll newspapers into rolls an inch thick. Cut them into sections three inches long and tie each with a string. Melt a cake of paraffin in a kettle. Dip the paper rolls in the paraffin several times, allowing them to cool for a minute after each dip. The paraffin hardens on the paper and turns it into a trench candle. The easiest way to dip them is with a long string.

To light a fire with a trench candle, thrust a stick in the end of it, light it and hold it under the wood. Neither rain nor wind will put it out and it will keep blazing away until the wood is burning. In heavy wind it can be lighted under the protection of the tent and carried out to the fire. That is why the trench candle is better than an ordinary candle, which would be quickly snuffed out in a breeze. An ordinary candle is used only in good weather.

It's always a temptation to get out a trench candle every time we light a fire. Don't do it! The rainy day will surely come when they will be needed badly. Save them.

Trench candles make good torches, too—see page 113.



Paper egg cartons - fill each compartment with sawdust, pour melted wax over sawdust until saturated, allow to harden. To use - break off one cup. (sawdust from lumber yard - take bag with you)

KEEP YOUR MATCHES DRY

DID YOU EVER think what would happen if you were caught in the woods without matches? No fire to cook your food—no heat to keep you warm or dry your clothing. . . . Matches are more important than ax, tent, blanket, than any item that a camper uses. Yet one good rain or ducking in the lake may ruin them all. *Keep your mind on your matches! And keep them dry!*

To be caught without matches is criminal neglect. We *must* have fire. Check each of the following before leaving home:

1. *Are you taking enough matches?* Figure out how many you will need, and then take more!

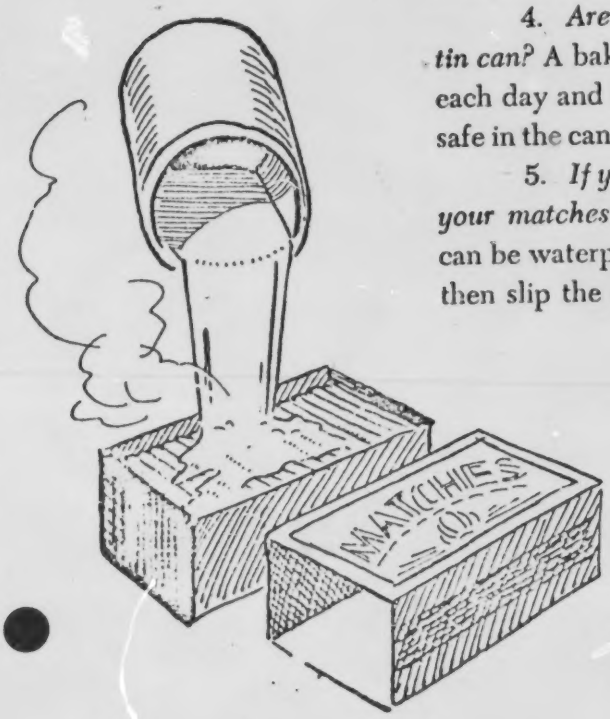
2. *Are you taking the big kitchen matches?* They are the only dependable kind in camp.

3. *Are you carrying a matchbox in your pocket?* Is it waterproof? And will it float? If not, it is unsafe. This matchbox is for emergencies only, never to be opened except in dire need. This is your safety deposit when all other matches are gone or ruined.

A matchbox can be made by slipping a 16-gauge shotgun shell over a 12-gauge one. It is better to play safe, though, and buy a dependable one. The best kind has a screw-on top, one that can be unscrewed by pressing on it with the palm of the hand, without using the fingers.

4. *Are you carrying your main supply of matches in a tin can?* A baking-powder can is good. Take out what you need each day and carry them in your pocket. Keep the main supply safe in the can.

5. *If you are going on a long trip, have you waterprofoed your matches with paraffin?* A whole box of kitchen matches can be waterproofed at once. Heat the paraffin, pour in the box, then slip the cover back on. The paraffin hardens into a block and will keep matches safe from water. When matches are needed break off a block and work the matches loose.



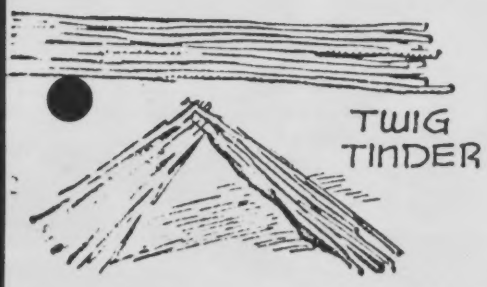
end and place the other end on a stump or log. Whittle long, slender shavings, leaving them attached as in the picture. Whittle all around the stick until the shavings extend out in all directions. Such long shavings cannot be cut unless the end of the stick is resting on something solid. To prevent them from being cut loose, press harder with the knife as the end of the cut is neared.

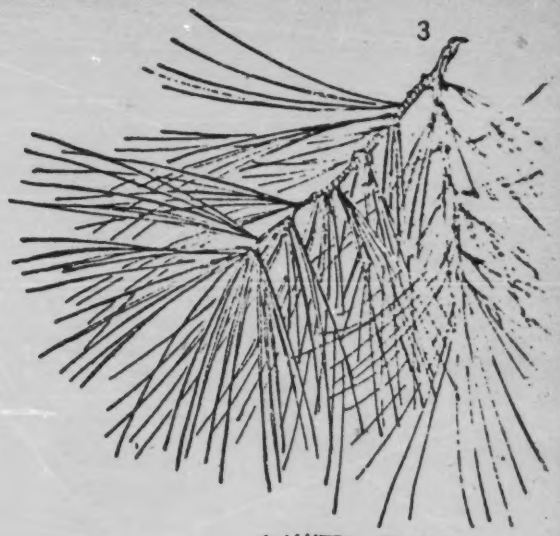
Stick the pointed end in the ground and stack the wood around the fuzz stick. A touch of the match will start the fire burning.

A fuzz-stick is not easy to make. At best it requires good whittling, and takes time. That is why most campers prefer the shaving clusters.

Shaving Clusters.—These are easier and quicker to make than fuzz-sticks and just as good. Find a piece of split wood, soft and dry. Whittle long, slender shavings, leaving them attached until you have six or eight of them, then cut the whole bunch loose. We thus have a cluster of shavings attached as in the picture. Make two or three of these clumps, lay them on the ground and pile the kindling over them.

Twig Tinder.—Campers who are not handy with a jackknife can always manage to make a fire with twigs. Get a big handful of dead twigs, bone dry, and *no larger than a straw*. They should be a foot long. Break the ends off so that all are of the same length. Hold the bunch in both hands, lay it over your knee and break them in the middle. Then place on the ground so the twigs stand up like a little tepee. Stack the kindling around them. Such twigs are called *snap wood*. If they do not snap when you break them they are not dry enough to burn. Get them from dead branches on standing trees, not off the ground. Hunt for tiny ones!





KINDLING

SOFTWOOD MAKES THE best kindling. Softwood lights easily and burns rapidly—indeed, it fairly explodes with heat. Hardwood, on the other hand, is slow to start. All of the evergreens are soft—*pine, cedar, fir, spruce,* etc.—as are such broadleaf trees as *basswood, box elder, tulip* and *sumac.* These are all excellent for kindling.

The quickest way to get kindling is to pick up some *squaw wood,* that is, some dead branches. These are good if they are small enough and dry enough. How small? The size of a lead pencil up to the size of your finger—the smaller the better. How do we know if they are dry enough? The test is if they *snap* when you break them. Don't pick them up off the ground except in very dry weather—wood on the ground is apt to be damp, and kindling must be very dry. Hunt around for a standing tree that has dead branches on it, or find a fallen limb on which the twigs do not touch the ground. Unless it is actually raining these are sure to be dry.

Better than squaw wood is *split* softwood. Split wood always burns better. Once you find a dry softwood log, it is a good plan to split a quantity of it and keep it in the tent. Then it is always handy, and always dry. Kindling must be split very fine.

Can softwood be used for the firewood also? No—it is the poorest of firewood, and for the same reason that it is such good kindling. It burns too rapidly and goes dead too quickly, and it leaves no coals at all. Only for boiling water and for baking is it good. For cooking fires and campfires, the hardwoods described on the next page are needed. Good firewood is tough to start, however, and that explains why both hardwood and softwood are needed in making a campfire.

GOOD FIREWOOD

DID YOU EVER have the fire bog down when your dinner was half-cooked? That is downright discouraging. The food smells good and everybody is hungry, but the fire just won't burn. The reason is clear—the *wood* is of the wrong type. One cannot pick up just any stick that happens to be lying near and expect to cook dinner with it. The different kinds of wood vary a great deal in the way they burn. Not all are good for firewood.

Good firewood has staying power, burning steadily and evenly for a long time, and when spent, leaves a bed of hot coals.

"Softwood for kindling, hardwood for firewood." That is the rule that campers follow everywhere. Or to put it another way, "Softwoods for a quick, hot blast; hardwoods for a steady, even fire that leaves glowing coals." Coals there must be, for most cooking is not done on the flame, but on the coals after the flame dies down.

Do you know the trees whose leaves are shown on these two pages? They are the six best firewoods. They burn steadily

and long, and leave coals aplenty. You should know them—they are the campers' friends.

Hickory is the best of all firewood. Excellent, too, are the *oaks* (especially the *white oaks*), *sugar maple*, and all of the *birches*. And *beech* and *white ash* will never fail you. Other woods that will do are locust, ironwood, chestnut, aspen and buckeye.

Of course we cannot always find the kind of wood we prefer. In seeking firewood we look first for down logs, and it is sometimes difficult to tell the species of these. But we can at least tell whether they are evergreens or broadleaf logs, and in such cases we will do well to *avoid the evergreens, except for kindling, and seek broadleaf logs*. Not all broadleaf logs are good, but our chances will usually be better with them.

A down log must be thoroughly dry and unrotted. Swing your ax into it to make sure it is solid, firm and sound, and pry up the bark to see that it is not water-soaked. Strike small poles against the ground—if they break easily they are too rotted to use.

Remember that split wood always burns better than round wood. If the sticks are two inches or more in thickness they should be split.

Stack up the woodpile so that the sun and wind can keep it dry. Throw a poncho over it at night or when it rains.

STACKED WOOD STAYS DRY

WIGWAM FIRE

FIRST A LITTLE tinder, then a few slender sticks of kindling set around it, and lastly larger sticks of firewood of the size of your fingers and thumbs, all stacked up in tepee fashion—such is the wigwam fire. No perfect imitation of a tepee is it, though, for the twigs are laid against the tinder in natural fashion, with their top ends overlapping, but as larger and larger wood is added it gradually stacks up to an irregular point.

Keep it small—the tepee of kindling is only six inches high, and the whole fire not over a foot tall. Only beginners build big fires—Indians and woodsmen make them small and get up close to them.

Fire burns up—give the wigwam height so that the flames can run up the sticks. Squatty fires burn lazily.

Fire needs air—do not stack the sticks too close together. Leave a little air space between them.

Is the wigwam a good kind of fire? Yes, and no—it is good for some things. After all, there are only two kinds of fires, the *wigwam* and the *crisscross*. The wigwam makes a big blaze and so is prized as a campfire to sit around at night, but it is not a good cooking fire. Although excellent for boiling a single kettle, it will not do for cooking an entire meal. It throws all the heat up to the peak of the wigwam and provides no spread for the pots and pans; it does not produce an even bed of coals, because, when the tops of the sticks are burned to coals, the bottoms are still blazing. As a fire for cooking the crisscross is more advantageous.

The wigwam is nevertheless important for it is the starting torch of every fire, used whenever fires are lighted. First the wigwam is built and then the wood is stacked around it for whatever arrangement is desired.

COOKING IN THE OUTDOORS

Materials Needed: Decisions about materials will be made after menus are planned.

Proceedure:

1. Select sight for cooking area
2. Meet with small groups to plan outing. Emphasis should be placed on good nutrition, adequate portions, transportation of food and utensils to sight, ease of preparation and clean up.
3. Students plan in detail
   a. menu
   b. food needed
   c. utensils needed
   d. job descriptions
   e. work assignments
4. After menu is selected go over receipes with students for cooking proceedures and fire preparation
5. Go over other operations to be sure each student understands his/her responsibility

ONE POT

POCKET STEW (serves 4 to 6)

Each scout brings a vegetable or some bouillon cubes.

4 raw potatoes
1 stalk celery
3 handfuls of green lima beans
4 raw carrots
1 wedge of cabbage
6 or 8 bouillon cubes

Put one cup of water for each person into a kettle and place it on the fire. Bouillon cubes are dropped into the kettle, and while waiting for the water to boil, each scout peels and prepares her own vegetable. When water is boiling, each vegetable is cut up into kettle. Leader seasons-remembering that the bouillon is salty.

.....

JUNGLE STEW (serves 10 to 12)

3 can kidney beans
1/4 c. fat
1 c. macaroni (uncooked)
salt and pepper
2 cans tomatoes
2 lbs. hamburger
2 onions.

Brown onions and meat in fat in pan. Boil macaroni until tender and drain. Combine all ingreadients and simmer for twenty minutes.

.....

CORN CHOWDER (serves 10 to 12)

12 slices bacon or salt pork
10 med. sized potatoes, diced
salt and pepper
6 onions
2 cans corn
2 qts. liquid (water or milk)

Cut bacon or pork and onions very small. Fry in the bottom of kettle until brown. Stir frequently to prevent burning. Pour off extra grease, if necessary. Add diced potatoes about ½ hour before serving time and cook til done. Just before potatoes are done, add corn. Season and add milk just before serving. Bring to boil, but do not boil.

VARIATIONS

This is a basic chowder recipe that may be varied as desired: Ham, fish, clams or other vegetables may be used in place of the corn. If meat, fish, or raw vegetables are used instead of corn, it will be necessary to cook them longer.

Ham - use 5 cups of cubed ham instead of corn.
Fish - use 5 or 6 cups of fish instead of corn.
Carrot - use 5 cups of diced carrots instead of corn.
Celery - use 8 cups of inely diced celery instead of corn. Just before serving add 5 chopped hard boiled eggs.

.....

CORNED BEEF STEW (serves 4 to 6)

2 cans condensed split pea soup
1 can water
1 8 oz. can mixed vegetables
1 12 oz. can corned beef, cubed
1 cup pkg. biscuit mix
1/3 cup water

Over low coals, combine soup, water, the undrained vegetables and corned beef. Bring to boil. Stir together biscuit mix and remaining water. Spoon dough into boiling stew. Cook uncovered 10 minutes. Cook covered 10 minutes more. Stir before serving.

ONE POT

POTLUCK BEANS (serves 4)

1 16 or 18 oz. can baked beans
1 16 oz. cut green beans (drained)
1 8½ oz. can lima beans
2 tsp. inst. minced onions
1 12 oz. pkg. smoked sausage links cut into bias pieces

In pan combine all beans and minced onion. Stir in smoked sausage. Cook over medium heat for 10 to 15 minutes stirring occasionally until heated through.

.....

ITALIAN (serves 4 to 6)

1 lb. hamburger
1/3 cup chopped onion
1 tsp. garlic salt
1/3 tsp. salt
1 can tomato soup
1/3 cup water
2 cups cooked noodles
1 cup shredded cheese

Brown hamburger, onion and other seasonings Combine mixture with soup, water and cooked noodles. Sprinkle cheese over top and cook till cheese begins to melt.

.....

CHILI MAC

1 pkg elbow macaroni (8 oz.)
1 lb. hamburger
1/2 cup chopped onions
2 tbs. oil
1 16 oz. can tomatoes
1 16 oz. can chili with beans
1 to 2 tsp. chili powder (opt.)

Cook macaroni as directed, drain. Brown hamburger with onions until lightly brown. Add tomatoes and chili. Add macaroni and heat until hot.

.....

GYPSY STEW

2 lbs. chopped ham
2 cans vegetable soup
2 eggs
5 tbs. fat
2 onions
2 cups cooked rice

Dice onions and brown in fat. Mix ham and rice into well beaten eggs, form small balls. Flour each and cook in fat till done. Add salt and pepper to taste. When almost done, pour soup over. Cover and heat thoroughly.

.....

CHILI (serves 12)

1/2 cup bacon drippings
2 tsp chili powder
2 cans canned tomatoes
3 cans kidney beans
salt
1/2 cup chopped onion
2-1/2 pounds hamburger

Fry onions in fat til light brown. Add meat and cook until done. Add tomatoes and beans and cook. Season with chili powder and salt. Let simmer.

ONE POT

MASTER PLAN FOR ONE POT MEAL for 12

Into one pot: 3 lbs. hamburger browned
1 pkg. dehydrated onions
1 pkg. dehydrated sweet peppers
2 cans tomato soup
salt and pepper

Then Add:
1. American Suey - add 4 cans spaghetti
2. Spanish rice - 1 lg. pkg. minute rice cooked separate
3. Spaghetti - 1 large pkg. spaghetti cooked separate
4. Mac Beef - large pkg. macaroni cooked separate
5. Hunters stew - 3 cans vegetable soup
6. Yoki special - 3 cans spaghetti and 2 cans peas
7. Chili - 4 cans kidney beans
8. Squaw corn - 3 cans corn and 1/2 cup diced cheese
9. Hungarian hot pot - 4 cans baked beans

.....

WOODLOW BARBEQUE

1-1/2 lbs. hamburger
1 large onion
1 large bottle catsup
1 green pepper
1/2 small head cabbage
1/2 bunch celery chopped
salt and pepper

Brown hamburger and diced onion. Add chopped pepper, chopped celery, cut up cabbage, and catsup. Cook until done.

.....

CAMPFIRE STEW (serves 12)

3 lbs. hamburger
1 large onion diced
salt and pepper
3 cans concentrated vegetable soup
1 tbs. fat

Make little balls of hamburger, add seasoning. Fry with onions in fry pan till onion is light brown and balls are well browned. Pour off excess fat. Add soup and enough water to stop sticking. Cover and cook till meatballs are cooked through

.....

CHILI (serves 8)

1 lb. hamburger
2-1/2 cups kidney beans (#2 can)
1-1/2 tsp. chili powder
3 tbs. water
1 lb. diced onion
1-1/3 cup tomato soup (1 can)
3 tbs. flour
1 tbs. salt.

Brown meat and onion, add beans and soup. Cook for 10 minutes. Add chili powder, flour, water, and salt.which has been mixed to a paste. Cook slowly for 45 minutes. Stir.

.....

SQUAW CORN (serves 8)

8 slices bacon
2 cans corn
3 onions sliced thin
toast or crackers

Fry bacon til crisp. Add onions, fry til light brown. Add corn and salt to taste. Serve with toast or crackers.

61

ONE POT

ONE POT SPAGHETTI (serves 12)

3 lbs. hamburger
3 onions
3 cans tomato sauce
6 tbs. oleo
1 large catsup
15 cups water
24 oz. spaghetti, broken up
3 tsp. salt

Brown hamburger and onion, add liquids, salt, oleo, and bring to a boil. Add spaghetti and cover and cook. Stir occasionally until spaghetti is tender. 15 to 20 minutes

.....

BAGS OF COLD (serves 12)

4 cups flour
2-2/3 tbs. baking powder
1-1/2 tsp. salt
5 tbs. shortening
water or milk for desired consistency
5 cans tomato soup
1 lb. American cheese

Make up dough as you would for biscuits or use bisquick. Roll dough into round balls putting a smaller ball of American cheese in center of each dough ball. Knead the dough carefully around the cheese. Drop balls into hot tomato soup. Cook slowly till dough is cooked through.

.....

STEW (serves 8)

3 lbs. stew meat
1 lb. carrots
1 bunch celery
1 large onion
1 or 2 cups tomato juice
1/2 cup sugar
1/2 box instant tapocia
9 potatoes peeled and diced

Add all the ingredients into a large pot. Do not cook anything in advance. Cook and keep covered about 4 hours over coals or the same amount of time at 250°.

.....

BEEF CASSEROLE (serves 24)

4 lbs. hamburger
3 pkgs. noodles
3 or 4 cans mushroom soup
2 reg. cans green beans
1 pt. sour cream
soy sauce to taste

Brown hamburger, add salt and onion. Cook til onion is cooked and add mustard, catsup and brown sugar. Simmer 10 minutes.

.....

BEAN SOUP (serves 8)

2 cups dried navy beans (1 lb.)
3 qt. cold water
1 ham bone or small shank end of ham
1 large onion minced
salt and pepper

Soak beans in water overnight. Add ham, onion. Heat to boiling. Cover and simmer 4 to 5 hours til beans are tender and liquid partially cooked down. Season to taste with salt and pepper.

ONE POT

MARILYN'S BBQ (serves 24)

6 lbs. hamburger
salt, minced onion
2 tbs. mustard
1 tribe size bottle catsup
3 or 4 tbs. brown sugar

Brown hamburger, add salt and onion. Cook til onion is cooked and add mustard, catsup and brown sugar. Simmer 10 minutes.

.....

POTATO SOUP (serves 6 to 8)

8 med. potatoes
1 qua[illegible] milk
2 tsp. salt
1/4 tsp. pepper
1 tbs. butter
1/2 cup flour
1 egg well beaten
2 to 3 tbs. milk
1/4 cup chopped onions
3 tbs. bacon drippings
4 or 5 strips bacon, fryed

Cut potatoes into approx. 1/2 in. squares and cook in boiling salted water til tender, drain. Add 1 qt. milk to potatoes and heat. Blend in salt and pepper. Cut the butter into the flour, blend into the egg and milk using only enough to drop into the hot soup. Drop by teaspoons. Add onions, bacon and 3 tbs. bacon drippings. Cover and cook about 10 min. Serve at once.

.....

CHILI (serves 50)

8 lbs. ground beef
4 lbs. ground pork
3 quarts (approx. 3# onions chopped)
1 lg. bunch chopped celery
1 gallon (8 no. 303 cans) cooked tomatoes, for extra thick chili reduce tomatoes to 3 qts.
2 quarts tomato puree
2-1/2 gallons (16 no. 2 cans) red kidney beans
2/3 cup salt
1 cup chili powder
1/4 cayenne pepper

Brown beef and pork, stir to brown evenly. Pour drippings into large kettle. Pan fry onions and celery in drippings, till transparent. Combine all ingredients. (2 large 3 gallon kettles will be necessary) Cook slowly, uncovered on fire. Stir frequently Will store in freezer for 4 months.

SKILLET OR GRIDDLE COOKING

MACARONI SKILLET (serves 6)

6 slices bacon
1/2 cup chopped onion
1 cup water
1 cup uncooked macaroni
1 can cream of tomato soup
grated cheese

Brown bacon in skillet; remove bacon. Add onions to drippings, cook til tender. Return bacon to skillet, add water and macaroni. Cook til macaroni is tender; stir in soup. Heat thru. Add 1/2 cup cheese and stir til melted. Sprinkle with cheese to serve.

.....

MEAL IN A FRYPAN (serves 4)

1 lb. ground beef
2 tbs. chopped onions
2 tbs. shortening
1 1 lb. can whole tomatoes
2 1 lb. cans pork and beans
1 tsp. salt
1/4 tsp. pepper
1 tsp. prepared mustard

Brown ground beef and onion in shortening. Add remaining ingredients. Simmer for 20 to 30 minutes.

.....

GRIDDLE BREAD

1 cup cornmeal
2 tbs. flour
Boiling water

Mix cornmeal and flour with boiling water til thin enough to pour. Cook on griddle like hotcakes. Serve while hot.

.....

HUSH PUPPIES (serves 6)

2 cups self-rising cornmeal
2 eggs
1/2 cup finely chopped onion
Buttermilk
Hot fat

Mix meal, eggs and onion with buttermilk to medium consistency. Drop by spoonfuls into hot fat, in a large skillet. Cook till brown on all sides.

.....

APPLESAUCE PANCAKES (serves 8 to 12)

1/2 cup apple juice
2/3 cup applesauce
1 egg
3 tbs. melted butter
1/3 cup milk
1 tsp. sugar
1 cup pancake mix

Combine all ingredients and mix till well blended. Drop batter on hot griddle. Serve with Cinnamon-butter syrup.
1 tbs. sugar 1/2 tsp. cinnamon
1/2 cup melted butter. Mix sugar and cinnamon, add butter, mix well.

.....

FRENCH TOAST (makes 24 slices)

1-1/2 cup milk
1/2 tsp. salt
6 eggs
24 slices bread

Beat eggs and add milk and salt, take a slice of bread and dip in egg mixture til entirely covered. Fry on lightly greased griddle or skillet till brown on both sides.

SKILLET OR GRIDDLE COOKING

PEACH LUNCHEON MEAT (serves 4)

1 12 oz. can luncheon meat, sliced
1 16 oz. can peach slices

In skillet over medium coals, brown meat slices on both sides; push to one side of pan. Drain peach slices, reserving 1/4 cup syrup. Place peach slices in skillet; spoon reserved syrup over meat and fruit. Heat for 5 minutes.

.....

GRILLED TUNA SANDWICHES (serves 4)

1 6½ or 7 oz. can tuna, drained and flaked
1/4 cup finely chopped celery
1/3 cup mayonnaise or salad dressing
8 slices bread
4 slices American cheese

Stir together tuna, celery and the mayonnaise. Spread half bread slices with mixture. Top each with cheese slice and another bread slice. Butter tops and bottoms of sandwiches. Cook on griddle or skillet over low medium coals til brown on both sides.

.....

CORN BREAD ROUNDS (makes 8 rounds)

1 8½ or 14 oz pkg corn muffin mix
2 tbs. nonfat dry milk
1 egg
1/3 cup water

Combine muffin mix and milk powder. Beat egg and water to blend; add to mix, stirring just til moist. Drop in mounds, using 2 tbs. for each, on a lightly greased griddle or skillet. Cook over low coals turning to brown both sides, 6 minutes in all. Serve with butter.

.....

MEXICALE RICE (serves 8 to 10)

2 lbs. hamburger
1 large chopped onion
1 cup chopped green pepper (opt.)
2 cups uncooked regular rice
3 tsp. salt
2 cans tomato sauce
2 cups hot water
2 tsp. mustard

Brown hamburger in skillet, add onion, green pepper and rest of ingredients. Bring to boil, cover and simmer 35 minutes.

.....

BACON AND CHEESE OMELET (individual serving)

2 slices bacon
2 beaten eggs mixed with very little milk
1 slice American cheese

With kitchen shears cut bacon into small bits dripping carefully into hot skillet. When bacon is 2/3 cooked pour in egg. With shears cut cheese into chunks dropping direct to omelet. When almost cooked fold carefully and cook a little longer. Turn or flip to finish. Careful, omelet breaks easily.

SKILLET OR GRIDDLE COOKING

BEEFY SCRAMBLED EGGS (serves 4)

1 4 oz. pkg. sliced dried beef
2 tbs. butter or margarine
8 beaten eggs
1 3 oz. can mushrooms, opt.

In heavy skillet over medium coals, cook dried beef in butter til edges curl. Add eggs and mushrooms, cook til eggs are cooked desired way.

.....

APPLE RAISIN PANCAKES (makes 24 2-1/3 inch pancakes)

1 14 oz. pkg. apple cinnamon muffin mix
2 eggs
2/3 cup water
2 tbs. cooking oil
1/2 cup raisins

In bowl, combine muffin mix, eggs and water. Beat til smooth. Stir in oil and raisins. Using 2 tbs. batter for each, cook pancakes over low heat on lightly oiled griddle.

.....

PANCAKE MIX VARIATIONS (makes 18 pancakes)

2 cups complete pancake mix
1-1/3 cups water
1 cup finely chopped ham, or
1 cup blueberries or
1 cup chocolate chips

Combine mix, water and OR. Using 2 tbs. batter for each, cook pancakes over low heat on oiled griddle. If using chocolate chips do not serve with syrup.

.....

BACON-WICHES (serves 4)

8 slices bacon
2 slightly beaten eggs
1/2 cup water
1/4 cup nonfat dry milk
1/4 tsp. salt
8 slices bread

Cook bacon on griddle or in skillet til crisp, pour off excess fat. Remove bacon and set aside. Combine eggs, water, milk powder and salt; dip bread in mixture. fry in bacon drippings on griddle til golden. Crumble bacon and place atop half of toast, cover with remaining slice. Drizzle with hot apple syrup.

.....

CRISPY GRILLED HAM AND CHEESE (serves 4)

8 slices white bread
butter, softoned
mustard
4 thin slices boiled ham
4 slices cheese
8 tomato slices
2 slightly beaten eggs
2 tbs. milk
dash onion salt
crushed potato chips

Spread half bread slices with butter and other half with mustard. Top with slices of ham, cheese, and 2 tomato slices. Top with second slice of bread. Combine eggs, milk and onion salt. Dip both sides of sandwich in egg then chips. Brown on griddle.

SKILLET OR GRIDDLE COOKING

TUNA BURGERS (serves 4 or 5)

1 can cream of mushroom soup
1 can (7 oz.) tuna, drained
1 tbs. minced onion
1 tbs. minced green pepper
4 or 5 hamburger buns.

Combine and spoon into 4 or 5 hamburger buns which have been opened and brushed with butter. Grill in skillet or wrap in foil and grill.

.....

PIE IRONS

PIZZA (per serving)

2 slices bread
2 tbs. hamburger, sausage mixture
1 tbs. pizza sauce
1 or 2 tbs. grated cheese

Brown hamburger, sausage mixture before hand. Spread 2 slices of bread as if you are making a grilled cheese sandwich. Add hamburger, sauce, cheese and grill in pie iron approx. 5 minutes on each side. Remember the bread should brown.

.....

PIES (s(per serving)

2 slices of bread
2 tbs. desired filling

Either spread bread with butter as making grilled cheese sandwich or spread butter inside of iron. Cook over coals til bread is browned or approx. 10 min. per side. Irons do become very hot so care should be used. Remember to remove excess bread showing outside of iron.

DUTCH OVEN COOKING

CALICO BEANS (serves 12)

1 can kidney beans
1 can butter beans
1/2 lb. bacon cut up
1 lb. hamburger
1 med onion, diced
1/2 cup packed brown sugar
1/2 cup catsup
2 tbs. vinegar
1/2 tsp. salt

Drain kidney and butter beans reserving liquid. Brown bacon, hamburger, chopped onion in oven. Combine all beans with bacon mixture. Add the remaining ingredients (b. sugar, catsup, vinegar, salt) and pour over beans. Add reserved bean liquid if and when mixture becomes too dry. Cook over coals with lid on and coals on lid. 1 hour.

.....

CHICKEN MARENGO (serves 8 to 10)

1 can tomato soup
1 can mushroom soup
2 cutup chickens
3 tbs. oil
1 lg. onion

Preheat oven. Brown chicken in oil and stir in remaining ingredients. Covering placing coals on lid as well as under. Cook 45 min. or until chicken is done.

.....

TUNA CRUNCH (serves 12)

3 cans cream of celery soup
1 cup milk
3 cans tuna, drained and flaked
6 hard boiled eggs, sliced
3 cans peas
1 can french fried onions

Preheat oven. Blend soup and milk. Stir in tuna, egg, peas. Heat thru. Serve on biscuit with French fried onion rings on top.

.....

BISCUITS IN DUTCH

Use mix or biscuit receipe. Preheat oven. Turn dough out on lightly floured board and knead 3 seconds. Roll to $\frac{1}{2}$ inch thickness. Cut with knife or remove ends from small can to cut round biscuits. Flour edge of can. Press don't twist. Don't roll or reknead dough scraps. Press them together gently to make biscuit piece. Put biscuits in bottom of ungreased oven with some space between. Put on lid and set oven on coals. Add coals to lid - it must be hot. May take 10, 12 or 15 minutes.

.....

DUTCH OVEN COBBLER (serves 8)

2 #2-1/2 can fruit pie filling
1 small box biscuit mix
1 tsp. cinnamon
1/4 cup sugar
1/4 stick butter or margarine

Preheat oven and lid by placing near fire. Pull good supply of coals and place warm oven over coals. Dump fruit in oven. Add sugar. Replace lid and bring to boil. No coals on lid at this time. Open box of biscuit mix, make cup in mix add water and with fork make small dumpling sized balls of biscuit mix. Remove lid and drop biscuit balls to cover top of fruit. Remove from coals and load only lid with coals. (just a few coals under) Bake for about 15 or 20 minutes or till golden brown. Rub top with butter and sprinkle with cinnamon and sugar mixture.

DUTCH OVEN COOKING

COWBOY COFFEE CAKE (serves 8 to 10)

3 cans refrigerator biscuit mix
1/2 cup melted butter
1/2 cup packed brown sugar
1/2 cup chopped nuts
1-1/2 tsp. cinnamon

Overlap biscuits in heated greased Dutch. Combine remaining ingredients and sprinkle over biscuits. Bake for 12 to 15 min. with coals on lid ONLY.

.....

KOOKIE DOODLE (serves 6)

1 8oz. box seashell macaroni
1 lb. hamburger
1 small onion
2 tbs. butter
1 16 oz. can tomatoes
1 can tomato soup
1 tbs. sugar
1 tbs. Worcestershire
1 small can mushrooms
salt and pepper to taste
1 lb. longhorn cheese cubed

Cook macaroni according to directions. Saute hamburger and onion in butter. Add tomatoes, soup, sugar and Worcestershire sauce, mushrooms, salt and pepper. Mix throughly. Add cheese and cooked macaroni Cook in oven with coals on lid and under for 25 minutes.

.....

CHICKEN TAMALE PIE (serves 6)

1 can condensed cheddar cheese soup
1 8 oz. can tomato sauce
2 5 oz. cans boned chicken
3/4 cup packed precooked rice
2 15 oz. cans tamales

In oven combine soup, sauce, rice and chicken. Cover and simmer over coals for 5 min. Arrange tamales on top of mixture. Cover and cook with coals on lid as well as under.

.....

NO UNTENSIL COOKING

HOBO POPCORN
'make your own jiffy pop'

4 squares of heavy foil
4x4 inches
4 tsp cooking oil
1/2 cup popcorn
string

In center of each square foil, place 1 tsp. oil and 1 tbs. popcorn. Bring foil corners together to make a pouch. Seal edges well, allowing room for expansion during cooking. With string tie each pouch to a long stick. Place pouch directly on hot coals and shake constantly till corn is popped. Season to taste.

NO UTENSIL COOKING

CAMPFIRE HAM KABOBS

1 cup ham, 1 in. cubes
1 cup pineapple preserve
1 cup catsup
24 or 32 buns

Place ham on skewer or sticks cooking over hot coals. Stir together pineapple and catsup brushing on ham while cooking. Cook and turn occasionally. Cook 8 to 10 min. Serve on buns if desired.

.....

FRANK A BOBS (Hideway)

Hot dogs
Pineapple chunks
Hot dog buns
Veg. oil or oleo

Cut each frank into 5 pieces. Alternate on skewer or stick with pineapple chunks; brush with oleo. Broil over coals and serve hot on buns

.....

HAM BOIL PACK (Ralston)

On piece of foil 8 x 8 inch square, place a cabbage leave (to prevent burning), put ham cubes, sliced potatoes and pineapple tidbits in center of leaf, season and use drugstore wrap for closing. Place on rack over bed of coals for 1/2 hour. Use left over foil to warm buns.

.....

EGGS BAKED IN ORANGE SHELL (Woodlow)

Remove all of the lining to the shell of half an orange. Break an egg into it, season and set in the coals to bake.

.....

HAMBURGER BAKED IN ORANGE OR ONION SHELL

For orange shell foloow directions above. For onion shell remove inside of huge onion and place hamburger inside onion.

.....

HAM OR SPAM PACK

Ham (Spam) 1 slice per girl
1 canned sweet potato
1 ring of pineapple
1 tsp. brown sugar

Place ham on piece of foil 8 inch square. Add sweet potato, brown sugar and pineapple ring. Drugstore fold and place on coals for 10 to 15 min.

.....

BAKED POTATOES (serves 10)

2 #10 tins cans
paper
sand or dirt
10 medium sized potatoes

Scrub potatoes and wrap each one in wax paper and then in wet newspaper. Using large tin can and sand or dirt, pack in potatoes so that no potato touches the side of the can or another potato. Wet the sand or dirt well. Place can directly on and in the hot coals and leave 45 min. or until potatoes are done. If sand or dirt drys, moisten again.

NO UTENSIL COOKING

BREAD TWISTS OR "DOUGHBOYS" (serves 10)

Green stick, peeled on end about twice as large as your thumb.
Biscuit mix or biscuit dough
7 cups flour
1 tsp. salt
7 tsp. baking powder
5 tbs. shortening
water

Mix dry ingredients, work in the shortening with fingers, add water to make a stiff dough. Flour hands. Heat stick and dip in flour, then winding it around stick like a ribbon, place half of dough on stick in a spiral with a little space between spirals. Cook slowly over coals turning continually. When done the twist should slip off the stick easily. Butter inside. May also wrap cooking end of stick in foil.

.....

KABOBS

Kabobs may be made of one-inch cubes of beef, ham, apple, tomato wedges, bacon, mushrooms, canned carrots, onion wedges, canned potatoes or any combination. Alternate your favorite combinations on a skewer and broil over fire.

.....

FOIL POTATOES (serves 10 to 12)

16 med or 12 large potatoes
4 tbs. butter
2 tsp. salt, some pepper

Slice potatoes very thin, leave skins on, place in foil over coals making sure the foil is well sealed. Cook 20 minutes.

.....

CORN ON COB (serves 4)

4 ears corn
butter or margarine
salt and pepper

Remove husks from corn. Spread corn generously with butter or margarine and sprinkle with salt and pepper. Wrap each ear in foil, sealing and twisting foil around each. Place on grill over hot coals for 15 to 20 min. Turning often.

.....

PIONEER DRUMSTICKS (serves 10)

10 green sticks
1-1/2 cup corn flakes
2-1/2 lbs. hamburger
2 eggs
salt and pepper

Crush cornflakes and mix with other ingredients. Wrap a small portion of this mixture around a stick the size of your thumb. (Make this long and thin, not a round ball.) Cook by holding over coals and turning often so that 11 sides cook evenly. Some prefer leaving the cornflakes out and rolling the 'drumsticks' in them just before cooking.

71

NO UTENSIL COOKING

ANGELS ON HORSEBACK (serves 10)

10 green sticks
1 pound cheese
20 slices bacon
10 split rolls with lettuce

Cut cheese in 3/4 in. squares. Cook bacon on a stick till partially done but not crisp. Wrap a slice of partially cooked bacon around a piece of cheese and secure with a twig or toothpick. Run a sharp pointed stick thru this and toast over coals till the cheese begins to melt and the bacon finishes cooking. Have bun and lettuce ready to hold "angel". Thin slices of cooked ham may be use in place of bacon.

.....

BAKED EGGS (serves 10)

Hot rock or ashes
10 eggs

Chip off a bit of shell, little larger than a pin head, from the larger end of the egg, without puncturing the membrane. Make a hole about the size of 2 pin heads thru both the shell and the membrane of the smaller end. Stand the egg, large end down, on a hot rock or in hot ashes, close enough to fire for reflected heat for about 5 minutes. Some wrap eggs in wet leaves for baking; others plaster them with clay.

.....

EGGS IN FOIL CUPS

4 eggs
4 squares heavy foil, 7x7 inches

For each serving, make a foil cup by molding 7-inch square of heavy foil around bottom of a 16 ounce can; remove can. Crack an egg into each cup. Place cups on grill over medium-low coals and cook 10 minutes or till desired doneness.

.....

BLUEBERRY MUFFIN BREAD
'bake quick breads without an oven'

2 9 inch foil pie pans
1 pkg blueberry muffin mix
Spring-type clothespins
Butter or margarine

Lightly grease the foil pans. Prepare muffin mix according to directions; pour into one of the pans. Cover with second pan inverted. Secure rims together with clothespins. Place on grill over low coals. Cook 15 min. on each side, rotating pan for even baking. Remove top pan; serve warm.

.....

BAKED APPLES
'cook while you're eating'

4 apples
1/2 cup red cinnamon candies
1/2 cup raisins
4 tsp. water
butter or margarine

Cut heavy foil into four 12 inch squares. Core apples, enlarging center slightly. Place 1 apple on each piece of foil. Fill center of apples, using 1 tbs. of candies and 1 tbs. raisins. Add 1 tsp. water to each, dot with butter. Bring up foil loosely over apple and twist ends to seal. Cook on medium low coals, turning often for 20 to 25 minutes.

DESSERTS

FROSTING MIX FONDUE (Hideaway)

1 pkg coconut-almond or coconut-pecan frosting mix.
1/2 cup nonfat dry milk powder
1/4 cup water
4 tbs. butter or margarine
3/4 cup to 1 cup water
Marshmallows, apple chunks, bananas

Combine frosting mix and milk powder in small pan. Stir in 1/4 cup water. Add butter or margarine and heat and stir til melted. Add enough water til mixture is of dipping consistency. Keep warm over low coals.

.....

SNOW ON THE MOUNTAIN (serves 12)

6 chocolate bars
36 soda crackers
1 box shredded coconut

Melt candy in a greased pan. Dip a spoonful onto each soda cracker and sprinkle with coconut.

.....

APPLE CRISP

12 cooking apples
4 cups biscuit mix
2 cups sugar
2 tsp. cinnamon
4 tbs. melted oleo

Grease baking dish, slice apples into it; and cover with other ingredients. Drizzle oleo over top. Cover with 2 layers foil and cook over coals 20 to 30 minutes. Place 4 or 5 coals on top so it bakes evenly. Charcoal recommended.

.....

CORN FLAKE CHEWS (serves 12)

6 cups corn flakes
2 cups brown sugar
1/2 cup maple syrup
2 tbs. butter

Cook sugar and syrup over moderate heat, stirring constantly til sugar dissolves and mixture bubbles for about 7 minutes. Add butter. Pour over corn flakes that have been placed in a buttered mixing bowl. Stir so each corn flake is coated. Drop by tsp. onto waxed paper or buttered surface.

.....

SPECIAL COOKIES

1-1/2 cups brown sugar
1-1/2 cups Karo syrup
1 cup lg. chunky peanut butter
1 cup special K
1 pkg. chocolate chips
1 pkg. butterscotch chips

Bring sugar and syrup to boil. Stir in peanut butter. Cook and add the Special K. Melt bits and spread over mixture that has been pressed into a cookie sheet (greased).

BEVERAGES

QUICK AND EASY HOT CHOCOLATE

1 qt. powdered milk mix
1 1b. box Nestles chocolate
1 6 oz. Pream or Creamora

Mix well all ingredients. Store in closed container. Use ½ cup dry mix to 1 cup hot water. Stir.

.....

FRIENDSHIP TEA

4 pkgs. instant tea with lemon and sugar added
1 7 oz. bottle of tang
1 cup sugar
1/2 tsp. cinnamon
1/2 tsp. ground cloves

Use about 3 txp. to cup of hot water.

.....

RUSSIAN TEA

2/3 cup instant tea
2 cup sugar
2 pkg. Wyler's lemonade mix
14 oz. tang
2 tsp. cinnamon
2 txp. ground cloves

Mix throughly. Use about 2 tsp.to 1 cup hot water.

THE BEAN HOLE

Dig a hole and line the bottom and sides with fairly heavy stones, leaving just room enough for the pot all around and allowing for enough depth so that the bean pot, Dutch oven or pail is placed on the bottom, its cover is 6 or 8 inches below the ground level. Line the hole with flat rocks, but beware of rocks that will shatter when exposed to heat such as shale.

Build a basic or teepee fire in the bottom of the hole and burn until the stones and rocks are very hot and the hole is filled with glowing coals. Some of the embers are removed and the container of food is placed in the center of the hot stones and coals. Some of the coals that were removed are placed about the pot and a dampened burlap bag or heavy cloth is placed over the top and quickly covered with the rest of the hot coals and earth. Remember to place some of the hot stones and hot coals on top of the container too.

Now shovel earth over all to a depth of a foot or more. There must be enough dirt to cover the bean hole so that the steam and heat cannot escape but remain inside to cook the food thoroughly. If it looks like rain, cover the bean hole with boards or an old piece of canvas or some other waterproof material. Bear in mind that it takes four to six hours to finish the cooking.

BEANHOLE BEANS

6 cup navy beans
1/2 cup molasses
2 tsp. dry mustard
2 sm. onions, diced
1-1/2 lbs. salt pork
3 tsp. salt
1/2 cup brown sugar packed
pinch of soda

Wash beans and soak overnight. Cook next morning over low heat till skins split, drain. Grease Dutch oven or kettle and sprinkle with layer of onions on bottom. Pour half of beans in and some of the liquid in which they were boiled. Drain so they are not super sloppy. Add a layer of pork, half of mustard, salt and brown sugar. Pour in rest of beans and sprinkle final layer. Pour molasses over all. Place a tight fitting lid over kettle and put into prepared bean hole. Beans should be just covered with liquid and the top must be secure or the beans will dry out. Takes from 6 to 8 hours.

.....

THE HAY HOLE

The hay hole is almost opposite type of cooking from the bean hole. The hay hole is only insulation around a "hot pot" while the bean hole is full of hot coals. Both forms of cooking are slow and can be left from one meal to the next with nobody on the site.

HAY HOLE TIMES AS FOLLOWS:

	boil on fire	hay hole		boil on fire	hay hole
Potatoes	15 minutes	2 hours	Macaroni	10 minutes	2 hours
Rice	5 minutes	2½ hours	Prunes	30 minutes	4 hours
Beans	60 minutes	4 hours	Oatmeal	5 minutes	overnight
Stew	45 minutes	3 hours			

MISC.

HOT APPLE SYRUP (makes ½ cup)

1/2 cup apple jelly
2 tbs. butter or margarine
1/8 tsp. ground cinnamon

In small pan, stir together all ingredients til melted and smooth. Use on such things as bacon-wiches.

.....

QUICK RICE-RAISIN PUDDING (serves 4 to 6)

2-1/2 cups water
1/2 cup pkg. precooked rice
1/3 cup raisins
1 cup dry milk powder
1 3 or 3½ oz. pkg. vanilla pudding mix.

In pan combine water, rice and the raisins, bring to boil; cover and simmer about 4 min. Stir in milk powder and pudding mix. Cook and stir til thickened and bubbly. Add a dash of ground cinnamon if desired.

.....

NO COOK FUDGE (makes 3 dozen 1 inch pieces)

1/3 cup water
1/2 cup butter or margarine
1 16 oz. pkg confectioners sugar
1/2 cup nonfat dry milk powder
1/2 cup cocoa powder
dash of salt

In medium pan bring water to boil, stir in butter or margarine til melted. Beat in confec. sugar, milk powder, cocoa and salt. Pour into buttered loaf pan or plate. Place in ice chest to cool for several hours.

.....

HAWIIAN MOUNTAINS (finger food per girl)

Cake donut (with or without confectioners' sugar)
tbs. kool whip
sprinkle with either coconut or put on a cherry
Variation: Chocolate cake donut
Kool whip
Mandarian orange slice and a cherry

.....

COFFEE OVER THE COALS

3/4 cup water per serving
1 tbs. regular grind coffee

In pan over med-low coals, heat water til just below boil. Add coffee and stir. Let mixture steep over coals for 6-8 min. DO NOT BOIL.

.....

TIN CAN STEW

This is a stew meal using hamburger balls, about walnut size, potato cubes, carrot slices, celery slices and whole canned tomatoes. Each 1# can serves two people. These should go on the fire which has good coals for about 30-40 minutes. They can be checked after 30 minutes to prevent them from being scorched.

CALCULATING BOARD FEET OF LUMBER FROM STANDING TIMBER

Equipment: Paper, pencil, lumberman's actuary, a board foot of different dimensions of lumber, Biltmore sticks, cloth tape, tape measure, board feet table, possibly a hand-held calculator

Procedure: Present the concept of a board foot by showing them a piece of wood 1" thick, 12" square. Then show them a 1 x 6 x 24" long. Explain that board foot will be one inch thick and a foot square or it will contain 144 square inches one inch thick. You could use a number of models of different dimensions lumber (be careful to explain that a 2 x 4 is no longer 2" by 4" but is approximately $1\frac{1}{2}$ x $3\frac{1}{4}$", never the less the designation remains and you pay for a 2 x 4 but receive a $1\frac{1}{2}$ x $3\frac{1}{2}$). Then show them various pieces of odd shape lumber and let them compute the board feet. (Some will undoubtedly be fractional or mixed numbers, for example a 2 x 4 one foot long would contain 8/12 or 2/3 board feet. After they have mastered this method of computation of board feet, introduce them to a lumberman's actuary and explain how a lumberyard figures out how much to charge you for the lumber you buy.

Once the student is able to figure board feet, it is time to show him how to calculate the amount of usable board feet in a live tree. Issue the class a handout chart which is a table to compute the board feet of lumber in a tree by diameter. Explore why the left hand side of the chart is shown in lengths of sixteen feet (16 feet is a standard lumber length). Why is it not broken smaller than half lengths? (The smallest usable piece of lumber for building is generally a stud which is eight (8 feet or slightly less).

With only a cloth tape and a pencil, have them compute the diameter and number of sixteen foot lengths in the tree. Using circumference, $d=c \div \pi$ calculate the diameter. They could just divide the circumference by 3 for a rough figure or they could go so far as to divide it out longhand or with a pocket calculator. The tree height could then be calculated by the artist or felling method. (Note that the sixteen foot lengths are measured up to the point where you estimate the diameter is 10 inches or more. If you are at all short of a half unit (8 f') you must go to the next lower figure. Then take this data to your board feet table and you can find the board feet by checking the left hand side for the number of 16 feet units and top for the diameter of the tree just above the trunk crown.

Now have the groups or individuals go back and measure the same tree using the Biltmore stick. Using the Biltmore stick you hold it as near to 24 inches from your eye as you can. To measure diameter, hold it against the trunk approximately $4\frac{1}{2}$ foot off the ground. Without moving your head, line up zero on the horizontal scale and also sight the right side of the tree and read the number you see at that point. Now you have diameter.

To find the height or sixteen foot lengths, pace away from the base of the tree to a distance of 66 feet. Pace the tree and hold the stick vertically. Place zero at the upper most point of the tree which you estimate is still more than 10 inches in diameter and not too limby. Still holding the stick at arm's length, read the figure on the stick which aligns with the base of the tree. If it is less than a whole in half unit, you must go down to the next lower. Now with this data, compute on the board feet table. How do the results of the two methods compare? What is an obvious shortcoming of the Biltmore stick? (You cannot estimate diameter larger than 5 feet or so).

TABLE FOR FINDING NUMBER OF BOARD FEET IN A TREE

DIAMETER OF TREE IN INCHES

NUMBER OF 16-FOOT SAW LOGS	10	11	12	13	14	16	18	20	22	24	26	28	30	32	34	36	38	40
1	39	49	59	71	83	110	140	180	220	270	320	370	420	480	550	620	690	790
1½	51	64	78	96	112	150	200	250	300	370	440	510	590	680	770	870	970	1090
2	63	80	98	120	141	190	250	310	390	470	560	650	760	870	990	1120	1260	1400
2½	72	92	112	138	164	220	290	370	460	560	660	780	990	1040	1190	1350	1510	1690
3	-	-	127	156	186	260	340	430	530	640	770	900	1050	1210	1380	1570	1770	1980
3½	-	-	-	-	201	280	370	470	580	710	850	1000	1160	1350	1540	1750	1970	2200
4	-	-	-	-	-	300	400	510	640	770	930	1100	1270	1480	1690	1920	2170	2430

81

82

HEIGHT ESTIMATION AND MEASUREMENT

Materials Required: pencil, short stick, meter stick, clinometer, tape measure, note pad.

Procedure: Pick out several different trees or objects and have the students estimate the height of them. After the students have recorded their estimations, have the students calculate the heights using the following methods.

I. Felling method.

Take a pencil or a stick and hold it at arm's length. Back up from the tree until the top of the pencil is even with the top of the tree and the bottom of the pencil is even with the base of the tree. Then lay or fell the pencil over to a horizontal position with the bottom of the pencil or the stick at the base of the tree. Have a partner walk at a right angle to the tree to a point at the end of the stick. You can then measure the height of the tree laid on the ground by pacing it off or with a tape or a rule.

II. Artist method.

Have a partner stand at the base of the object to be estimated. Hold a pencil or stick at arm's length and back up until the person is the same height as the pencil or stick. Then walk up the object counting the number of times the object can be laid upon top of each other to the top of the object. Count the number of sightings and multiply by the height of the person and you have the estimate of the height of the object.

III. Shadow or ratio method.

Pound or hold a one meter stick vertically into the ground. Measure its shadow cast by the sun making sure it is vertical. Then measure the shadow cast by the object to be estimated. Set up a proportion and solve.

Example:

$$\frac{1\text{ m (stick)}}{3\text{ m (shadow)}} = \frac{x\text{ m (object)}}{12\text{ m (shadow)}}$$

$$1m \times 12m = 3x\ m$$

$$12m = 3x$$

$$4m = x$$

object is 4m high.

IV. Clinometer.

Aim the clinometer at the top of the tree and back away until the string with the weight attached hangs at the 45 degree mark on the clinometer. At this point the top of the object should be seen exactly at the top of the sighting and the string should be exactly at 45 degrees. To find the height of the object, add together the distance from your eye to the ground plus the distance from you to the object.

Summary of key concepts:

The fact that these measurements are only estimations should be pointed out. However a comparison of the different methods should be made. For example, which is most accurate? Which is least accurate? Why?

The geometric properties should also be explored. What are the principles behind the methods? How can this be proved? Drawings of the different methods can be made to help illustrate the principles.

A discussion as of how professional surveyors measure these types of objects can be held. If possible, an exhibition of the methods can be held by one of the local engineers later back at the school.

The beginning of the lesson should be devoted to having the students try to estimate the heigths themselves with no assistance from the teacher. The resourcefulness can possibly bring about other methods that can be explored.

A clinometer can be made before going out to the sight if they are unavailable to you. This can easily be done in a classroom.

Directions: Tape a straw along the straight edge of a protractor. Tie a weight (a nut, washer or fishing weight) on one end of the string and put the other end of the string through the hole in the protractor. Tape a note card or a piece of cardboard to the back side of the protractor. Begin at 90 degrees and write 0 degrees in the adjacent area on the card. Then at 80 degrees write 10 degrees, etc. until you have corrected the angle scale.

Specific Activity: Field Study of a Rotting Log

Objectives

Students will demonstrate their knowledge of log decomposition by being able to identify or explain.

a. three forces of nature that help to decompose
b. three organisms that help to decompose
c. three ways plants help to decompose
d. the end product of decomposition

Learning Activity

Materials needed: rotting log. No other material is necessary. Magnifying glasses, insect and fungi guides are helpful.

General survey before detailed study

Old log or newly fallen tree? How can you tell?

What happens when a tree falls? What forces of nature go to work on dead tree?

Where is this tree located? Does its location have anything to do with the rate of decay?

I. Forces of nature
   A. Weather
      1. Rainfall
      2. Frost
   B. Forest Cover
      1. How effects decay
      2. Compare with log in more open area.
      3. Compare with log in a swampy area.

II. Insects
   A. Kinds
   B. What they do
   C. Examples
   D. Why more in some places than in others?

III. Plants
   A. Lichens
   B. Fungi
   C. Small plants

Specific Activity: Field Study of a Rotting Log (cont.)

Learning Activity (cont.)

IV. Work of plants

A. Root systems

B. Acids

C. Moisture preservers

D. Plant succession

V. Final decay

A. Final result

B. Good of this

VI. Reasons for leaving the log undisturbed

A. Enriches forest

B. Other people may want to study it

Evaluation

Teacher observation of learning experience. Student drawing of organisms that decompose, or teacher-made quiz.

NATURE CRAFTS IN OUTDOOR EDUCATION

Goal: To use nature craft projects to communicate skills, concepts and knowledge relating to outdoor learning activities.

Planning: Set the stage for creative crafts expression when planning the outdoor experiences. As goals are being developed, pose the following questions to students: "How can we use crafts projects to show others what we are studying?" "See if you can find materials to use for craft projects." Such questions may influence students to observe more carefully and to collect appropriate materials for their projects. Individual and small group projects can be encouraged.

Help children become aware of "outdoor etiquette" so as to understand and appreciate their studies of conservation and natural resources. Some examples of such etiquette are:

1. Conservation must be considered when collecting natural materials.
2. It is unlawful to pick or collect living things in most state parks. You may (under certain conditions) use dead things found on the ground.
3. Know how to preserve specimens that you collect.
4. Obtain permission from owners before collecting on private property (all property is owned by some person or group).
5. Collect only materials that are in abundance.
6. Many birds, flowers, plants and animals are protected by law. Become familiar with the regulations.
7. Do not collect from areas that are heavily used by people (such as near trails and buildings).
8. Do not mar landscapes--don't chip on rock faces.

These guidelines may help children to become aware of the importance of natural resources and be more concerned about pollution, destruction of property and other misuses of resources.

NATURE PRINT PROJECTS

Stamp Prints:

Equipment: materials such as potatoes, carrots, apples, and leaves; stamp pad paper, wood, cardboard, or some porous material, ink, water color, oil color.

Procedure: A stamp can be made from materials such as potatoes, carrots, apples, leaves and wood. These work on the same principle as a stamp and ink pad. After the stamp is carved, press into the coloring material (stamp pad, water color, oil color or some other material). The coloring may be soaked into a stamp pad or left in a liquid or near liquid state. Carefully press the stamp onto paper, wood, cardboard etc. Leaves need to be very gently pressed into the pad being careful to ink all of it. They can then be pressed carefully onto paper for stationery, etc.

Smoke Prints:

Equipment: vegetable oil or something similar, paper, candle, leaf, fixative, tempera powder

Procedure: Smoke printing provides one of the most delicate of all prints. It is a simple process, but for acceptable results, it must be done carefully. First, rub a thin layer of oil (vegetable oil or something similar) on a piece of paper. Next, light a candle and move the oil side of the paper near the top of the flame until it is black with smoke. Press gently but firmly, the leaf on the smoked surface, rub it well--then place the leaf onto a piece of clean paper, stationery, etc. Cover with another leaf or paper and rub over the entire area of the leaf. Lift up the paper and leaf carefully. A fixative may be sprayed after it has dried. Color may be added to the prints by lightly dusting with tempera powder immediately after making prints (blow off the excess).

Tracing Prints:

Equipment: leaves or similar items, pencil, crayon, paper

Procedure: Tracing prints may be made of leaves and similar items. Place the leaf on a flat surface with the vein side up. Cover with a paper and rub a pencil or crayon over the paper pressing down on the leaf. Broad sweeping strokes or short swift strokes can be used.

Crayon Prints:

Equipment: crayons, waxpaper, newspaper, leaves, potato peeler or something to shave crayons, an iron

Procedure: Cut wax paper into two equal size pieces. The size depends on the size of the wanted finished product. Lay out 3 or 4 layers of newspaper for padding. Place one sheet of wax paper on top of the newspaper. Make shavings of the crayons with the potato peeler on top of the wax paper. Place or leaves on top of the crayon shavings in a pleasing arrangement. More crayon shavings are shaved on top of the arrangement. Place the second piece of wax paper over the crayon shavings. Place two or three layers of newspaper over the waxpaper. Press with a hot iron until the crayons have melted. Remove the newspaper and find the finished project.

Blueprints:

Equipment: blueprint paper (a drafting supply material) leaves, grasses, ferns, cardboard, masonite or some other suitable material, piece of glass, water, hydrogen peroxide, a line for hanging the prints

Procedure: Blueprint paper may be used to obtain silhouettes of various plant parts such as leaves from trees, grasses, ferns, etcl, or patterns if more than one item is to be printed. Place the object on cardboard, masonite or some other suitable material and cover with a piece of glass. The blue sensitive side of the paper should be up. Hold, glass side up, and expose in the sunlight from 30 seconds to 2 minutes, depending upon the intensity of light. Take to a shady area and immerse in a solution of water and one drop of hydrogen peroxide, exposed side down for about 30 seconds. Hang on a line until dry.

Ozalid Prints:

Equipment: ozalid paper, ammonia, gallon jar, wooden block,

Procedure: Use the same process with ozalid paper as with blueprint paper. The exposure time varies for different colors of paper: approximately 12 to 25 seconds for red paper, 20 to 35 seconds for blue, 40 to 50 for black, etc. To develop, place concentrated ammonia in the bottom of a gallon jar. Place a wooden block on the bottom of the jar to keep the paper from touching the liquid ammonia. Roll the paper into a cylinder, print face inside, and place in the jar. Remove when the proper color and image appear (1 to 5 minutes).

Note: Ammonia solution 28% or stronger is necessary. This can be purchased in drugstores.

Specific Activity: Field Art Project

Objective: The student as a result of the art project will:

a. produce an art project using native materials.
b. be able to identify shapes, colors, and textures in nature.

Learning Activity

The following are examples of simple art projects that could be done at Bluffville without extensive materials. The teacher is reminded to only use materials that are abundant and the depletion of which would not affect the ecosystem at Bluffville. The staff member in charge will set collecting policies as they will vary with season.

Burdock Art

Gather burdock burs. Shape into baskets. Fill the baskets with dried weeds, grasses, etc.
Shape the burs into animals, birds, or insects. Twigs or leaf stems may be used for legs, ears, and whiskers.

Leaf Art

Collect large leaves. Carefully break the stems from them. Overlap the leaves and use the stems as pins to fasten them together. Make headbands or leis. These may be decorated with flowers or other interesting plants. Use only weed flowers such as Queen Anne's Lace or abundant plants.

Weathered wood, bark, dried materials, or other natural materials.

Interesting arrangements may be made with weathered wood, bark colored rocks, dried grasses and weeds, branches, or almost any material found on a field trip.

All of the above activities require no other materials than those found on a field trip.

Another idea might be to gather materials to take back to the classroom for a display. Again, rules need to be set on collecting.

Natural Soil

Blue clay - shape jar, vase, or some object.
Colored sand - sand paintings

Tracings - Sketches

Take chalk, crayon, or pencil to make tracings or sketches of natural materials.

Evaluation

The student will complete an art project using approved materials.

SAND CANDLES

MATERIALS:

* Sturdy cardboard box
* Candle wax or parrafin (1 lb. per candle on average)
* Candy thermometer
* Candle color or crayons
* Pencil
* ½ pail sand
* 3 lb. coffee can
* 2 potholders
* Wick and quarter size washer
* Propane torch

CAUTION: Wax is flammable. Watch pot very closely. If wax bubbles over or spills and catches on fire, immediately pour salt on fire. Do not use water on a wax fire. If you spill hot wax on yourself, smother burn (wax and all) under cold water. Then peel off wax.

GENERAL DIRECTIONS:

1. Moisten sand liberally and form a shape in it either with your hands free form or using a mold. Press sand firmly to make a very defined form and remove mold when wax is ready to pour.
2. Wax should be melted in 3 lb. coffee tin on stove estimating 1 lb. wax per candle. Never do more than 2 lb. wax per can.
3. Add color chunk to melting wax in shade you want.
4. Use candy thermometer inserted in wax and bring it to a temperature of 275° over a medium flame.
5. Remove from flame and pour into formed mold. You should hear a sizzling as wax "fries" into sand.
6. Prepare wick by cutting length needed plus 1½". Tie washer on one end and roll other wick end on pencil a little. Drop washer end in center of candle and carefully lay pencil across candle resting on edges of mold. This holds wick centered in candle while it sets. Wax sets on the outside in about 1 hour; inside about 2 hours.
7. Carefully lift candle from sand and brush surface lightly. Using propane torch, run flame over sandy outside area to give an aged brown look to candle. Also this melts wax slightly causing sand to adhere.

LESSON: NATIVE DYES

While it is true that commercial dyes come in a greater variety of colors and shades than dyes made from native materials, and are much more reliable and of a fast color, there is still satisfaction and charm in making and using native dyes. The materials for native dyes are easily obtained from the many plants, vegetables, fruits, and trees which provide these materials.

MATERIALS:

Onion skins	- Red or yellow dye
Raspberries	- Dark red
Blood-root	- Red
Beets	- Red violet
Strawberries	- Red
Mountain Ash berries	- Orange
Goldenrod plant and flowers	- Yellow
Pear leaves	- Yellow (dull)
Sumac roots	- Yellow
Sumac leaves	- Yellow brown
Celladine	- Yellow
Tanglewood stems	- Yellow
Citron	- Yellow
Elderberry leaves	- Green
Rhubarb leaves	- Light green
Larkspur flowers	- Blue
Blackberries	- Blue
Pokeweed berries	- Purple
Dandelion roots	- Magenta
Sassafras roots	- Pink
Butternut bark	- Brown
Walnut hulls	- Rich dark brown
Sumac bark	- Brown

Also needed are an enamel kettle for boiling the materials, plus the material selected to be dyed.

PROCEDURE:

Experiment in making the various native dyes by soaking the materials in water overnight, and then boiling for an hour or more to give the desired intensity of color. Strain well to remove all plant materials before using the dyes.

Stems and barks used for native dyes should be gathered during the spring or early summer. Roots should be collected in the fall, and leaves just as they are reaching full growth in the late spring. Flowers are gathered at the peak of bloom, and berries and seeds when they are ripe.

DYEING:

Place sufficient water in an enamel kettle to cover the cloth to be dyed. Add the concentrated dye to the water and bring to a boil. Place the cloth in the dye bath. Dye to the desired shade, remove, wring out and dry.

To make the dye fast, the material may be treated before dyeing. To treat the cloth, make an alum bath, using one ounce of alum to a gallon of water. For woolen cloth, add 1/4 ounce of cream of tartar. For cotton, linen, or rayon, add 1/4 ounce of washing soda. Boil the cloth for at least an hour, rinse well, and dry before placing it in the hot dye bath.

Try some of these dyes for tie-dyeing, or on unbleached muslin to be used for craft purposes or for costuming.

NOTES ON THE PREPARATION OF VARIOUS DYES:

Goldenrod - chop the flowers and plant into small pieces. Add water and bring to a boil. Simmer for several hours and then cool. After about 24 hours, reheat, add the cloth to be dyes and let simmer until the desired color is obtained.

Pear leaves - pound the leaves to shreds and bring to a boil until the maximum color is obtained.

Berries and stems - boil in a very small amount of water for two hours. Strain well and add one part of wood alcohol to three parts of dye to keep from spoiling too quickly.

Barks and roots - boil for four to five hours in a small amount of water. Strain and add one tablespoon salt for each pint of dye.

Onion skins - boil in small amount of water for about two and one half hours. Add cloth to the strained dye and boil for one hour.

Most of the native dyes are fairly permanent and should be used while hot on dry materials.

Outdoor Education

Individual Projects — Jim Shaulis

I. Art
   A. Use as many natural items as possible.
   B. Your work can be realistic or abstract.
   C. Give your work a title.

II. Games
   A. Invent a game
   B. Use only natural objects.
   C. Make original rules.
   D. Write out the rules (neatly).

III. Invent a wild animal.
   A. Use any available materials.
   B. Give body parts a purpose (example: claws for digging)
   C. Name the animal.
   D. If possible, create it in its habitat (don't forget camouflage.
   E. List its prey.
   F List its predators.
   G. Describe its adaptations.

IV. Invent a plant.
   A. Use any available materials.
   B. Give plant a special talent such as: catch insects, withstand high winds, etc.

V. Leaf collection (label neatly)
   A. Real thing
   B. Print
   C. Outline
   D. Rubbing

VI. Haiku Book
   A. Statement of nature
   B. Lines of 5-7-5 syllables
   C. Include illustrations and cover

VII. Look-a-like collection
   A. Natural objects that look like other living things or man-made things.
   B. Label each item (neatly)

VIII. _____

Geologic Setting of the L.C.A. Outdoor Ministries Center, Oregon, Illinois

Perhaps it is appropriate that the Outdoor Ministries Center should have as its most prominent topographic feature the "Devil's Backbone" and as its most significant geologic feature numerous outcrops of the rock layer known as the St. Peter Sandstone. Thus, geographic coincidence serves as a reminder of the intimate association of good and evil. These features constitute the west bluff of the Rock River at this point. Although the property does not directly adjoin the Rock River, the latter has played an important role in determining the character of the landscape of the Outdoor Ministries Center.

Bedrock

The St. Peter Sandstone is the exposed bedrock over most of the Outdoor Ministries Center. It takes its name from the former St. Peter River, now known as the Minnesota River, along whose bluffs it is well exposed at Minneapolis, Minnesota. It is present throughout the north-central United States, but in most places it is covered by younger strata and is not observed at the earth's surface. At Oregon, Illinois, however, an upwarp of the strata (known as an anticline) has occurred, bringing the St. Peter to the surface. A similar upwarp brings the St. Peter Sandstone to the surface at Starved Rock State Park near Utica, Illinois, where it forms Starved Rock itself. The rock consists of beautifully rounded, glistening grains of quartz and is interpreted as having formed the beach of an ancient sea which covered most of North America some 450 million years ago (middle Ordovician Period). The rock is poorly cemented and can easily be broken when rubbed between the fingers. It contains much void space between the grains which permits water to move readily through the rock long distances underground under pressure even where buried by hundreds of feet of overlying rock strata. This water can be tapped by wells and is used by many cities and towns as a water supply; in some places it is even naturally fluoridated. The rock is such a pure concentration of quartz that it can be used for making glass, as at Ottawa, Illinois. Ground silica, an ingredient in paint, pottery, and china, scouring powders, molds for metal castings, and enamel, is produced at the quarry immediately northwest of the Outdoor Ministries Center.

Along the western crest of the Devil's Backbone the St. Peter Sandstone is overlain by a few feet of shale, a form of clay, and this in turn is covered by up to twenty feet of limestone. The latter is called the Platteville Limestone, named after Platteville, Wisconsin. A product of deposition in an ancient sea, it is limited in extent and poorly exposed at the Outdoor Ministries Center, but it can be seen in several quarries two to four miles east of Oregon and at the large quarry on the north limits of Dixon, Illinois, ten miles downstream.

Topography

The bluffs of the Rock River including the Devil's Backbone constitute the bulk of the wooded areas of the Outdoor Ministries Center and are typical of the more rugged portions of the bluffs between Dixon and Rockford. The prominence of the Devil's backbone is due to the presence of a small remnant of resistant Platteville Limestone which erosion has not yet removed from the crest of the ridge. The bluffs themselves, of course, are also the result of erosion by the Rock River and its tributary ravines. In places this erosion has left small hills and knobs of sandstone lying detached and somewhat isolated along the foot of the main bluff. This is particularly apparent southwest of Gale Creek in the vicinity of the Dining Hall.

The present course of the Rock River is the result of the rearrangement of preexisting streams by the Ice Age continental glacier about 20,000 years ago. The accompanying map shows how the earlier streams were blocked by glacial ice coming from the northeast and how a new stream, the present Rock River, took its course along the edge of the glacier. Spillways, now marked by narrow, rugged portions of the valley, formed where this stream was forced to cross preexisting drainage divides. The Outdoor Ministries Center lies at one of these spillways.

Glaciers lay within the drainage basin of the Rock River from about 20,000 years ago until about 12,000 years ago. During this time the river carried huge quantities of sediment-laden maltwater from the glaciers, resulting in the deposition of sand and gravel on the floor of the valley to a thickness of as much as fifty feet. During the past 12,000 years, since the withdrawal of the glaciers, the river has worked at removing this sediment load and has cut down into it to the extent that the former valley floor now stands in the form of terraces whose surfaces are several tens of feet above present river level. The flat surface east of Highway 2 across from the Outdoor Ministries Center and along Gale Creek northeast of the Dining Hall are examples of such terraces.

Dr. Richard C. Anderson
Chairman, Department of Geology
Augustana College
Rock Island, Illinois

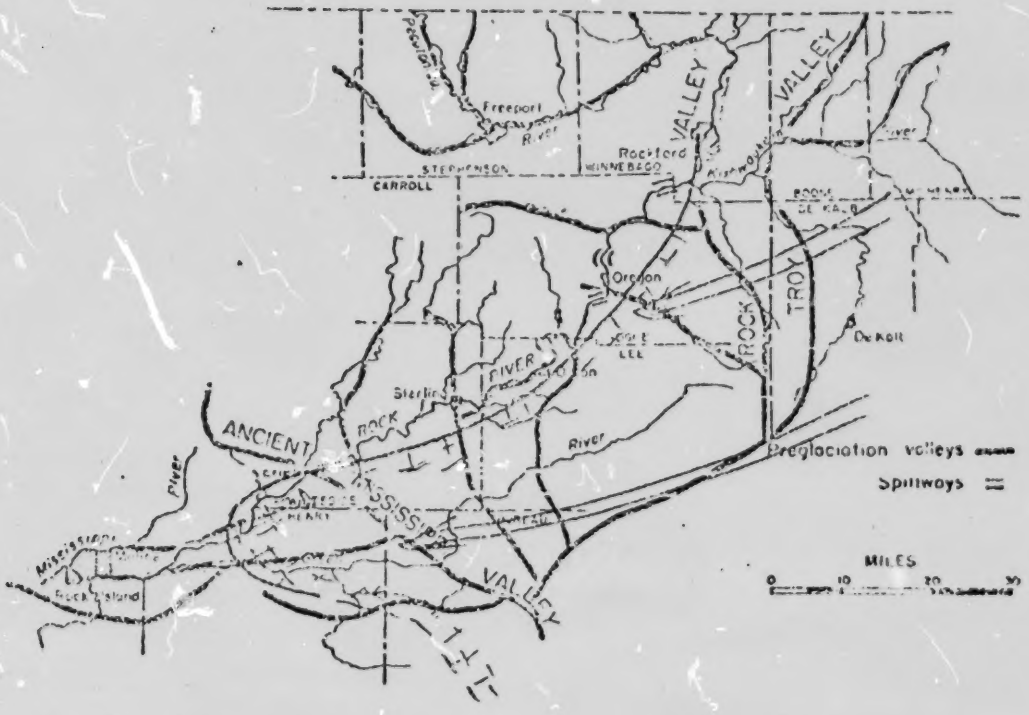


Figure 2 - Preglaciation bedrock valleys, glacial spillways, and present streams (adapted from Horberg, 1950).

Edge of glacier about 20,000 years ago.

Direction of glacier movement

Lesson: Gully Study at L.C.A. Camp

Materials: Notebook, pencil, collecting bags, hand lenses, rock and fossil guide, rock hammer, safety goggles

Procedure: There are several gullies at the L.C.A. Camp - any one should work well for this lesson. Once you decide on a gully you can start at any point, but you should plan on going to the mouth and the source of the gully during the lesson period. Below are some activities to do in the gully. You may do as many as you have time for since not all of them could be done in two hours.

1. Follow the gully to its mouth. How is the mouth similar to that of a river's? Is a delta formed? How was soil deposited there? Where does the material come from? Why does it end up there?

2. Examine a cross section of the gully. Is the soil the same from top to bottom? How deep does the topsoil go? Have pupils make a sketch of this cross section showing the different levels of soil.

3. Look for an area where a smaller gully flows into your gully. Walk along it a short way. Discuss its similarities to your gully. Are there any differences?

4. While in the gully look for signs of animal life. Keep track of the various types.

5. Look for a "pothole" or small basin in the gully. Discuss how they are formed.

6. As you near the source of the gully, look back and notice the drainage pattern of the gully. Make a map of this drainage pattern. Ask the children to speculate on how large an area the gully drains.

7. Notice the trees holding the soil. Speculate about what happened to the soil that was covering the exposed roots. What will eventually happen to the tree as a result of this?

8. Look for a place where debris has piled up in the gully. As you uncover these leaves what do you notice is taking place? Are there signs of life?

9. Look for different rocks along the route. Are any smooth? Why? How did the rocks get there? If you have a rock hammer, break some open. Try to identify specimens if you have a rock guide.

10. Find the source of the gully. What natural processes caused it to begin? How could the erosion be stopped or slowed down? Where will the gully be in 100 years? 1000? If there is time you might have students collect a mulch to spread on the bare spots at the edges and beginning of the gully.

Summary: These are some suggestions for things to do in the gully. Keep in mind that many of the activities should be exploratory for the children.

Specific Activity: Field Study of Soil

Objectives

Upon completion of the field study, students will demonstrate their knowledge of soil by:

a. being able to take a soil sample.
b. identifying the soil layers.
c. being able to tell how soil is formed from natural succession.
d. identifying three conservation methods designed to maintain topsoil.

Learning Activity

Materials needed: soil auger or small shovel, bags if samples are to be taken

Take soil samples from a prairie area and from the forest. Ask children the following questions about the soil they have sampled comparing the areas:

What do you see?
Do you see any small animals? What animals are most likely to live in the soil? Are there any layers in the soil? How many? What are these layers? What is the texture of the soil? Who or what benefits from the soil? How was the soil made? How can the topsoil be kept from eroding?

Discuss how the soil is made. This would include weathering, water, freezing, plant growth, and erosion (water, wind).

There are many follow-up studies that could be made back in the classroom.

Reference: MacKillican, William. Studying Soil. Toronto: The Ryerson Press, 1970.

Evaluation

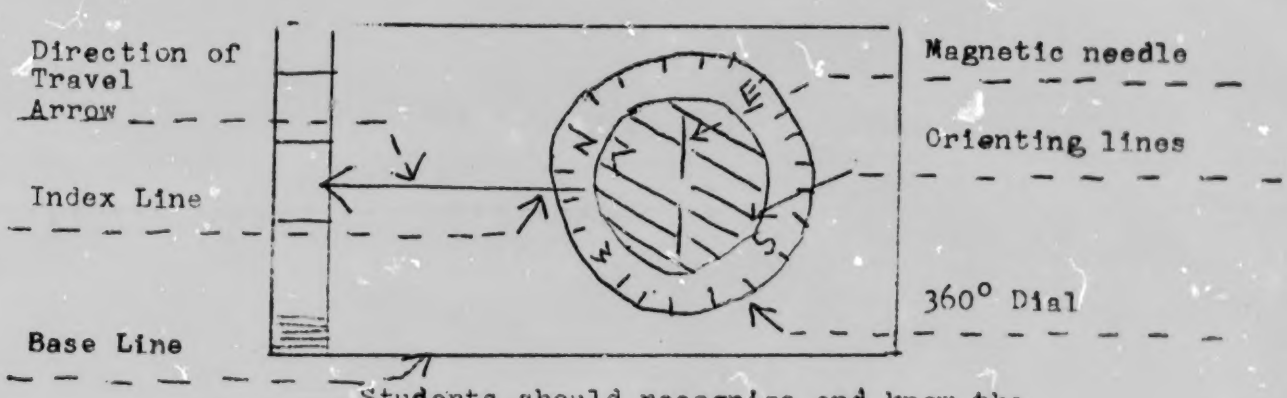
Teacher observation, no formal evaluation is planned.

Compass Parts and Functions

Materials Needed: Board diagram of compass with parts labeled

Compass

Procedure: Label the parts of the compass



Students should recognize and know the functions of the following parts of the compass.

1. index line: the point where the bearings are generally registered and read

2. magnetic needle: the floating north needle, . .always points to magnetic north

3. orienting lines: the parallel lines in the base of the circular housing

4. direction of travel arrow: exactly that. . the arrow on the baseplate that points the direction which you are to follow

5. baseplate: the rectangular clear plastic section which one holds onto

6. 360^0 dial: indicate the magnetic degrees from north

ACTIVITIES for COMPASS PRACTICE

Compass Practice

Materials Needed: Compass, worksheet, pencil, list of landmarks (i.e. fire hydrant, pine tree)

Proceedure: Student proceeds to the center of these landmarks and writes down the bearings they find for the landmarks.

Find the Penny - Indoor or Outdoor Game - Compass/Pacing

Materials Needed: Small object placed on the ground, compass

Proceedure: Place a small object on the ground. A triangular course is paced out in the following manner: select any bearing and follow it for 20 meters; add 120° to the original bearing and pace the same distance; add 120° again and the same distance. This should bring the student back to the start. Increase difficulty by increasing the pacing distance, or changing the bearing by a different fact of 360° to trace a different shape (i.e. 90° produces a square, 60° produces a hexagon.

Bearing Practice

Materials Needed: 20 - 30 small cards bearing a number, compass

Master Sheet with directions:

i.e. Control 1: 320° - 150 meters

Control 2: 80° - 50 meters

Proceedure: A circle is marked out at the center of an area. Cards bearing a number and a code letter are scattered around the area and hidden from view. Each student, with compass, receives a master sheet with directions for the controls. When he finds the control, he copies down the code, returns to the center and takes another bearing. The person who finds the most number of controls in a limited time wins. For variation, assign different point values to the controls depending on their difficulty to reach. Decisions than have to be made regarding the time allowed and which controls to gather.

ORIENTEERING COURSE

Leader Instructions:

This course has been designed to blend compass work, map reading, team work, strategy-building, and environmental awareness.

Materials: 1 watch with a second hand
compass and pencil for each entrant
score sheets
lined 3x5 cards, 2 per team

1. Hand out map/instruction sheets to each team having them keep the map down. Read through the instructions and ask for any questions.
2. Decide if the course will be done in teams or as a group. If necessary select starting order out of a can and log entrants on score sheet.
3. Though the course is timed, stress the importance of safety when running between checkpoints or allow no running at all.
4. As groups begin the event they turn the map over and begin to plan their course. The moment they turn over their map their time allotment begins. You should start each group by saying "go", with a 5 second count down. Log the time into the time column on the score sheet.
5. As each group prepares to leave on the course itself, they should file one of their two copies of the course plan with an official (you). Be sure that the two copies match up and the entrant number is on both.
6. Log the "time in" promptly when the group returns to the start/finish areas (Base checkpoint).
7. Calculate the elapsed time. If it is over their allotted time, they are assessed a penalty of 5 points for every 10 seconds they are over. Any whole minutes -30 points for every minute.

   Any parts of minutes:

seconds	points off
0-9	-0
10-19	-5
20-29	-10
30-39	-15
40-49	-20
50-59	-25

8. Check course plan cards. If the course is completed as planned within the allotted time, a bonus of 200 points is added to their score. No credit is given for any checkpoint logged with the wrong letter code.

Things to remember:

1. When introducing our orienteering course, have available examples of a letter stake and a checkpoint sign.
2. If the course is done in teams, supervision is difficult in that each team will be following a different course strategy.
3. Stress the importance of accuracy: play down the running.
4. Make sure the students are all comfortable with finding/following a compass bearing as well as pacing distances.
5. The course can be done using the metric system (meters). Check to see which system the teachers prefer--teach pacing accordingly.

ORIENTEERING COURSE

This course has been designed to blend map reading, compass work, and strategy. The course is contained within the boundaries of the camp.

Instructions:

1. Collect entrant number card, (2) 3x5 cards, pencil, compass and instruction/map sheet from course official.
2. You are to plot the course that will give you the greatest number of points within a time limit. The course has been designed to allow you 5 minutes to plan and the remaining time to run the course.
3. Your map will indicate certain numbered checkpoints. At each checkpoint there will be a posted compass bearing. Shoot your bearing from the checkpoint and pace off the indicated distance to arrive at the lettered stake.
4. Put your name and entry number on each card on the top right side. Figure out your course plan by listing the checkpoint numbers on the 3x5 cards. Use the left hand side of the card, and go down the left margin. Put the number of your first checkpoint on top, then the second below, and so forth. If you need additional lines, draw a line vertically down the middle of the card and start your additional checkpoint numbers to the right of that line.
5. The course official will call out your number prior to your starting. When you start, you will turn sheet over and begin studying your map. Log your course plan on the cards. Turn one card in as you leave, with an official. Keep one yourself to record the checkpoint letters.
6. While on the course:
   1. Remember to stay on your outlined course. A 200-point bonus will be added if you "complete" your plan.
   2. DON'T BE LATE. You will be penalized 5 points every 10 seconds you are late.
   3. Mark your checkpoint letter next to the checkpoint number.
7. Upon returning, report to the official. Have your arrival time logged. Turn in your checkpoint marker card. The official will calculate your score.

COURSE CHECKPOINT MARKER CARD

Order of checkpoint #'s Name _____ No. _____ ← Your entry number

	Letter	
1		11
2		12
3		13
4		14
5		15
6		16
7		17
8		18
9		19
10		20

Line #'s ←

Put one checkpoint number per line. Checkpoints can only be used once.

ORIENTEERING SCORE SHEET

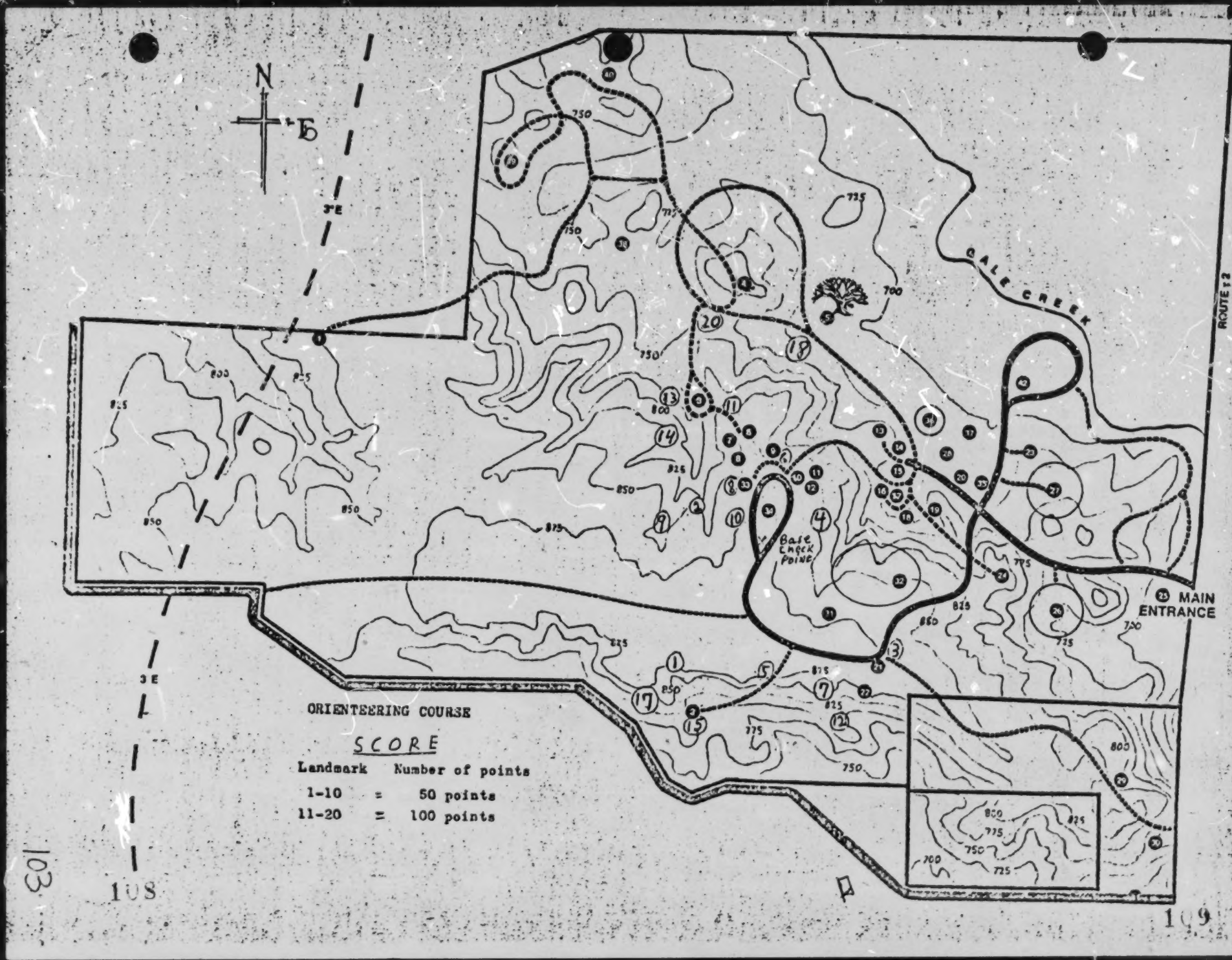
Base starting time _____:_____ Heat No._____ Date_____

Starting Order: Entrant Number	Time Out	Time In	Elapsed Time	Over Time	Penalty Points	Course Points	Bonus Points	Total Score	Entrant's Name

106

107

201


N
Б
3E
GALE CREEK
ROUTE 12
Base Check Point
MAIN ENTRANCE
ORIENTEERING COURSE
SCORE
Landmark Number of points
1-10 = 50 points
11-20 = 100 points
3E
А
103
108
109

Correct Answers for Checkpoint letter codes (and score).

Checkpoint	Letter Code	Score (# of points)
1	I	50
2	S	50
3	E	50
4	O (decoy V)	50
5	M	50
6	R	50
7	J	50
8	C	50
9	U	50
10	P	50
11	B	100
12	K	100
13	N	100
14	D	100
15	G	100
16		
17	T	100
18	F	100
19		
20	L	100

WEATHER WISDOM

CITY-DWELLERS CONCERN themselves but little about the weather, and, paying little attention to it, are the poorest of weather prophets. The camper, on the other hand, lives with the weather every minute of the day and night. It is important to him, it affects his every plan and move. It is forever on his mind. The result is that he soon becomes wise to the ways of the weather, able to forecast its moods and changes.

The Indian has a nose for the weather—he has lived in it with little or no shelter all his life. The old salt of the sea has a nose for the weather; so, too, the woodsman, the trapper, the farmer. . . . The closer one lives to the earth the better he knows the whims of the winds and the rain. Wherever we are camping, we shall find in the old-timers who live there the best of weather prophets for that particular region. It pays to ask them, and it will be pretty safe to take their word for it.

It is fun to forecast the weather, and the best of good training, for the surest way to learn is to start forecasting and then to watch the results of our predictions.

Many are the weather proverbs that have come down to us from long years past, most of them foolish, but some of them full of wisdom. The best of them are not always right, but neither is the weather man. There is truth in the following sayings. Check them to see how often they are correct.

Red sky in the morning, sailors take warning;
Red sky at night, the sailor's delight.

When the dew is on the grass
Rain will never come to pass.

When the grass is dry at morning's light.
Look for the rain before the night.

East wind brings rain, west wind fair weather.

Rain before seven, clear before eleven.

It is when we are going on the water in canoes, boats or rafts that the weather becomes doubly important to us. There are winds and waves stronger than the strongest paddler and oarsman. In an offshore wind the water may be calm nearby, but rough, very rough, farther out. If the weather is threatening, never go out on the open water—it is always better to hug the shore and go the long way around.

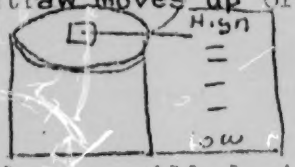
111

105

ACTIVITIES

I. How to makes:

A. Tin can barometer.
Materials: one tin can, a broom straw or soda straw, a rubber band, a peice of saran wrap(large enough to cover the top of the can), a piece of scrap paper, and a paper clip.
Construction:
a. Place saran wrap over the top of the tin can and hold tight with the rubber band.
b. Wrap the paper around the can so part of it is higher than the top of the can and staple it in place.
c. Attach the straw to the middle of the saran wrap with glue or tape.
d. Make the position of the straw on paper with the paper clip, and watch to see if the straw moves up or down.



B. Rain Guage
Materials: a one inch olive jar(pickle jar will do if long and narrow.) a five inch funnel, a #2 coffe can, asmall file. If funnels or bottles of the sized mentioned above are not available, the following formula may be used to determine the amount of rainfall:

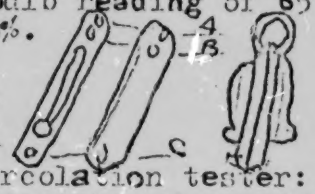
$\frac{r^2}{R^2} \times D$ = Rainfall in inches.

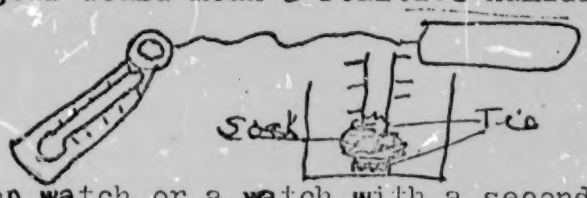
r= radius of olive jar
R=radius of funnel.
D= depth of water in container

Procedure: Mark the olive jar in $\frac{1}{4}$" increments using a small file. Place the funnel so that the rain goes directly into the olive jar. The coffee can should be completely by the funnel so that water will not get into the can unless it overflows from the olive jar.

3. Sling Psychrometer.
Procedure: Purchase two inexpersive metal backed thermometers. Place back to back and drill holes at points A, B, andC as shown below. Put small bolts and nuts through holes B andC to hold the thermometers together. Put a small key ring through the hole in point A. Attach a lenght of cord or chain to a handle so the psychrometer will swing freely. Using cotton, make a sock that will fit snugly over one of the thermometer bulbs. Just wrap the cotton and tie it at

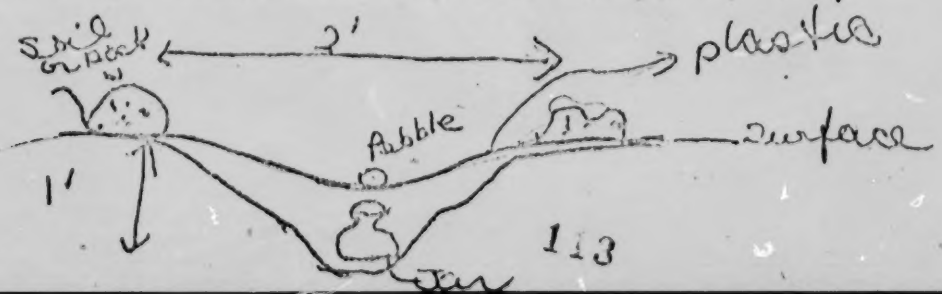
top and bottom as shown.
Use: Soak the sock in water until it is saturated. Sling the psychrometer around for one minute. Record the temperatures from both sides and compare your results to a chart of relative humiditics. Example: a dry bulb reading of 73 degrees and a wet bulb reading of 65 dregees would mean a realtive humidity of 65%.





4. Percolation tester:
Materials: one watch(stop watch or a watch with a second hand), one one-pound cofee can with both ends cut our of it, one one-pint jar or cup, one plastic jug for carrying extra water
Procedure: Push the coffee can into the ground at the selected site so that water poured into it will not seep out from under the edge. The lower edge should be pushed into the ground about one inch deep. measure one pint of water and pour it directly into the top of the coffee can. Note and write down the time as soon as the water is poured in. Note and write down the time it takes for the water to disappear. The difference in time is the percolation rate. Select several spots around camp. Two of these spots should be places where people seldom or never walk. Example: under shrubs or brush, the middle of a field that doesn't get much traffic. The two other spots should be places where people have obviously affected the soil by walking on it orstanding by it. Examples: the area around home base, the path to the beach. Rate of percolation should be figured as amount of water/time and converted to gallons per hour. lqt./90 sec. = 1 gal/520 sec. = 1 gal/12 mins. or 1/12 gal/min.

5. Solar still:
Materials: a piece of 3'x3' plastic, a tin can or jar
Procedure: Dig hole two feet in diameter sloping to a depth of one foot. Save soil from hole. lay plastic over hole after placing can or jar in low part of hole to catch the water. seal the edges with the soil. Place a stone in the middle of plastic and allow plastic to slip until the stone is right above but not touching the jar.
What will Happen: The sun will heat the air between the soil and the plastic causing water in the soil to evaporate. This evaporated water will condense on the plastic, run downhill because of the stone, and drip into the jar.



Specific Activity: Seed Dispersal

Objective:

Students will demonstrate their knowledge of how seeds are spread by identifying methods, gathering examples, and classifying the examples on the seed chart.

Learning Activity

1. Discuss with the class what seeds are and how they are spread. Emphasize that man is the biggest carrier of seeds and this can be either good or bad for the environment.
2. Hunt for different types of seeds and figure out how they are spread.
3. Have each child find one seed to represent each method on the seed dispersal sheet.
4. Complete the assignment by placing each seed under the proper classification on the seed dispersal chart.

Methods of dispersal:

	Examples
I. Wind-borne seeds	
A. Winged seeds	maple
B. Seeds with parachutes	dandelion
C. Wind scattered	ragweed
II. Hitch-hikers	
A. Sticky seeds	wild radish
B. Burs	burdock, cocklebur
III. Animal carriers	
A. Animals that bury seeds	squirrels
B. Animals that cache seeds	chipmunks
C. Man	
1. Discarding seeds	
2. Unintential carrying	
3. Intentional planting	
IV. Seeds that pop from plants (touch-me-not)	
V. Water-borne seeds	lotus, walnut

Follow Up - Discuss back in class man's interference with the natural cycles of seed dispersal. What does man do to control unwanted plants. Can some methods be harmful to the environment. Are there alternatives?

Evaluation

Students will complete the seed dispersal classification sheet.

SEED DISPERSAL

Wind-borne Seeds			Others
Winged Seeds	Seeds with Parachutes	Wind Scattered	Hitch Hikers
Birds	Animals - People	Pop from Plants	Water

WILD EDIBLE PLANTS

Materials required:

knife or sharp stick

containers to collect and cook plants

a comprehensive text on edible wild plants and mushrooms

a spirit of adventure and an open mind

Procedure:

"To you the earth yields her fruit and you shall not want if you but know how to fill your hands."

Kahlil Gibran

The Prophet

Discuss with the students that there can be several purposes for using wild plants. First of all, they are free for the picking. Sencondly, it can be a real adventure in finding and eating wild plants. Finally, if you have a basic knowledge of wild plants, it may one day keep you alive in an emergency situation.

I have attempted to avoid listing plants which are endangered or likely to be confused with poisonous or inedible varieties of plants. It should be pointed out to the student to carefully identify the plant and its edible parts. Some plants contain both edible and poisonous parts. You should also point out that even though a plant is quite edible it should be avoided except in a real evergency if it is not a common plant. Careless foraging could destroy rare and endangered plants.

The following listing of plants is common to this general geographic area and is listed according to season. The page number which appears at the right refers to the page where that variety can be found in Medsger's Edible Wild Plants. Scientific name and identification information can be found there if you are unfamiliar with the plant.

SPRING EDIBLES

Name	Useful Parts	Preparation	Page
Wild Strawberry	berries	fruit can be eaten fresh, processed into jelly or made into syrup	20
Black Raspberry	berries	same as above	25
Blackberry or Dewberry	berries	same as above	31
Common Burdock	leaf stalks	raw in salad cooked as asparagus	166
	root	peeled and boiled	
Common Milkweed	shoot and leaves (only a few inches tall)	boil several times to remove milkweed juice, cook like spinach	155
	young pods (before silk forms)	boil with meat	
Wild Asparagus	young shoots	raw in salad or boil	162
	seeds	roasted and ground, coffee substitute	
Marsh Marigold or American Cowslip	leaves	boil like spinach, can be creamed	145
Shepherd's Purse	leaves	peppery flavor, spinach substitute, blanch and serve as salad	164
Lamb's Quarter or Wild Spinach	leaves and stems	raw in salad cooked as spinach with lemon or vinegar pick only young tender plants	140

211

Chicory or Blue-Sailors	Young leaves	boiled like spinach pour off water several times.	158
	tender roots	cooked as carrots	
	mature roots	roasted as coffee substitute or to flavor coffee	
Peppergrass	young leaves	garnish or as salad	164
Common Plantain	leaves	used as a spring green	166
Horse-radish	root	grate and use as condiment	149
	tender leaves	used in mixture of spring greens	
Water Cress	leaves	use as salad green (caution - do not harvest from polluted water)	148
Curled Dock or Yellow Dock	young leaves	Use as potherb Boil several times to remove bitter taste	139
Dandelion	leaves	do not cook too long but change water several times to remove bitterness, serve with vinegar	159
	root	dry, roast, and grind for coffee substitute	
Stinging or Great Nettle	tender tops and leaves	boil as potherb	138
Nodding Wild Onion	leaves	may be used to flavor	175
	bulb	strong but edible when boiled, use in soup, sometimes pickled	

Sugar Maple	sap	sap is collected in Feb to April, condensed into maple syrup or sugar	228
Box Elder	sap	same as above but takes a great deal more sap	231
Silver Maple	sap	same as above but more desirable than box elder	231
Morel Mushrooms, Sponge Morchella Esculenta or Morchella Deliciosa	all but rooted base	salt, pepper, flour, fry in butter (oleo)	Miller 214-215
Puffballs Caldatia Gigantia	all but rooted base	slice and fry as above (caution - do not confuse young puffball with button stage of poisonous varieties, to check, slice through middle, if embryonic form is found do not use; do not collect and store known and unknown types in same container)	Miller 196-199

SUMMER EDIBLES

Mulberry Black, red and white	berries	as fresh fruit	6, 8, 9
May Apple or Mandrake or Wild Lemon	fruit	as fresh fruit as with green apples, do not overeat	13
Smooth Gooseberry	berry	as fresh fruit, jelly or pie	19
Red Raspberry	berries	same as above	24

Blackberry	berries	same as above	29
Wild Ginger	roots	dry and use as spice	181
Cattail	root and lower stems	young sprouts used as asparagus, peel and cook, can be used in salad, roots dug, dried, and ground into flour	196
Spearmint	leaves	as garnish, boil and make into tea, flavor jelly or cooked dishes	218
Peppermint	leaves	primarily as flavoring or as tea	218
Sumac, Smooth or Staghorn	berry cluster	boil and make a drink, sweeten, staghorn gives vinegary taste, smooth gives lemon-like taste	213
Compass Plant or Pilotweed	gum secretion	resinous gum can be used as adhesive or to chew	232

Fall Edibles

Papaw or Custard Apple or False Banana	fruit	as fresh fruit	9
Red Haw or Hawthorn or Thorn Apple	fruit	as fresh fruit or jelly	40
Wild Black Cherry	fruit	as fresh fruit	48
Choke Cherry	fruit	has astringent qualities, disappears when cooked	50

Sweetbrier or Wild Rose	hips	for jelly or tea	89
Wild Grape	fruit	for juice or jelly	56
Nut Trees			
Shagbark Hickory Hazelnut Butternut White Oak Black Walnut	nuts	eaten raw, or dried and ground into flour, other varieties of oak acorns are edible but may have to be boiled several times to get rid of bitterness	99 105 96 111 94
Black Locust	seed pods	are slightly acid and oily but become palatable with boiling, use similar to peas and beans	120
Honey Locust	seed pods	same as above has sweet secretion in pod, is slightly astringent	121
Jerusalem Artichoke	root	use like potato, can be pickled	194
Western Prickly Pear	fruit	remove bristles and peel, can be eaten raw, stewed, or dried for winter use juice used to fix color	63
Hackberry	berries	as fresh fruit	5
Spruce	needles	boil and use for tea	220
Sulphur Mushroom Polyporus Sulphureus	all but base	remove only fresh, young growth saute as for morels	Miller 182
Hen of the Woods, Polyporus Frondosus	all but base	same as above All may be dried for later use	Miller 182

WINTER EDIBLES

Winter is not a time of plenty in the wilderness but many of the summer plants and their fruit may be stored for winter. The bark, the leaves, add the nuts of some plants can be found in the winter. Some plants like watercress continue to grow in the winter and can be found in springs.

Summary:

Obviously this list could be much longer but I tried to compose the list of plants which are common to this area.
This unit could be keyed to the plants which exist on our outdoor education center. A nature walk could be constructed using some of these plants as stations. You could collect some of them to cook and/or sample at the end of the walk.
Above all, stress the conservation of nature. Caution students to collect only plants which are abundant and safe.

BIBLIOGRAPHY

ANGIER, Bradford. Field Guide to Edible Wild Plants. Harrisburg, PA: Stackpole Books, 1973.

Angier, Bradford. More Free-for the Eating Wild Foods. Harrisburg, PA: Stackpole Books, 1969

Gibbons, Euell. Stalking the Faraway Places. New York, NY: David McKay Co. 1973.

Medsger, Oliver Perry. Edible Wild Plants. New York, NY: Macmillan Publishing C . (Collier Books 1976).

Miller, Orson K. Mushrooms of North America. New York, NY: E.P. Dutton & Co.

Weeds of the North Central States. University of Illinois Agricultural Experiment Station Circular 718, revised October 1960.

Zim, Herbert S. and Shuttleworth, Floyd S. Non-Flowering Plants. New York, NY: Golden Press, 1967.

KEYING FLOWERS

Materials:

Students will need a pencil and paper for field use.

Procedure:

The following chart can be duplicated and taken to the field or the students can make their own chart to record similar data. Recording the required information and making rough sketches can be very helpful. Students should be encouraged to make sketches of each flower part as well as making a written description.

1. Leaves:
   a. shape

   b. size

   c. arrangement on stem

   d. shape of stem

2. Sepals
   a. number

   b. color

   c. length

   d. shape

3. Petals
   a. number

   b. color

   c. size

   d. shape

4. Stamens
   a. number

   b. color

   c. shape

5. Pistils
   a. size

   b. shape

   c. color

   d. attatchment above or below petals

If it is impossible to determine the name of the flower in the field the information and sketches can be taken back to the classroom and used with a "Flower Finder" or other similar book. Time will, of course, need to be spent in defining flower parts before this chart can be of any value.

KEYING A STUMP

Materials:

The students will need a pencil and paper for field use.

Procedure:

The following chart can be duplicated and taken to the field or the students can make their own chart to record similar data.

1. Approximately how long ago was the tree felled? _____
2. Which way did the tree fall? _____
3. How old was the tree when it fell? _____
4. Was the tree's growth the same each year? _____
5. If not, in which yea rs did the tree make good growth _____
6. In which years did it make poor growth? _____
   _____
7. A re there signs of injury to the tree while it was alive? _____ What are they? _____
8. List any signs of decay._____

The chart can be made in any manner desired. Adiscussion on the site should take place concerning the information gathered. It is most fun to try to determine WHY the tree was felled. (logging, forest fire, etc.) It is, however, often impossible to determine this exact ca use.

KEYING TREES

Materials:

Students will need pencil and paper for field use.

Procedure:

The following chart can be taken to the field or the students can make their own chart to record similar data.

1. Tree height _____meters
2. Width or diameter of trunk at a 1 meter height_____
3. Twigs opposite or alterrate _____
4. Leaves opposite or alternate_____
5. Leaves simple or compound _____
6. Lea f edges smooth, toothed or lobed _____
7. Leaves smooth or rough _____
8. Description of seeds if evident _____

   _____
9. Description of fruit if evident _____

   _____
10. Make a simple dra wing of any distinct characteristics

The chart can be made in any manner desired. A discussion of terms such as opposite and alternate leaves or simple and compound leaves is necessary before going into the field. It is important to remember that the students should put these answers in their own terms to enable them to more easily identify the tree when they get their hands on a "Tree Finder" or other similar book.

SOCIALIZATION GAMES

MATERIALS REQUIRED:

Trees
Stumps
Open field

DESCRIPTIONS OF VARIOUS GAMES:

1. Backward trust fall.

   Object: Individual will fall safely into the arms of the members of the group.

   Procedure: Individual stands of a stump approximately 5 feet high. The remaining members of the group form two lines opposite each other crossing arms and locking wrists. The individual on the stump then falls backwards and is caught by the members of the group.

2. Ring trust exercise.

   Object: Individual is kept from falling by all members of the group.

   Procedure: Group sits in a circle with legs out in front. One person is put in the middle and stands rigidly with arms at side. The person in the middle then closes his eyes and starts to fall backwards. The group then passes him from one to another.

3. People Pass.

   Object: To form a chain and pass each member of the group over the heads of each member from front to back.

   Procedure: Group sits on the ground with legs straight out against the person in front of them. When the first person is finished they sit at the end of the line until all have passed.

4. Stump.

   Object: To have an entire group stand on a small stump at the same time.

   Procedure: All members of the group must stand on the stump and support each other without any aids.

5. Bear Mark.

Object: The group tries to reach the highest point possible on a tree.

Procedure: The group is to determine the best method of attaining the point possible on the tree without any aid. The students may stand on each other, form a pyramid or use any method they wish.

6. Monster race.

Object: Competition between two or more groups to reach the finish line first.

Procedure: Groups are allowed so many feet and hands to touch the ground (depending on the number of people in the group. The number should be less than two for each person.) After the monster is built, it must cross the finish line intact.

Group interaction and initiative is to be stressed during these activities. The instructor should only be present for guidance and should allow the groups to make their own decisions as how to succeed at the tasks. Some well placed advice may be necessary at times. Hopefully the students will learn to work together and to rely on each other to accomplish certain goals.

STAR STUDY

Materials needed:

Flash light, paper, pencil

Ideal conditions for observations:

1. Clear sky
2. Cool temperatures
3. Moonless night
4. High elevation

Areas of discussion:

I. Color:

The color of the stars is determined by the different surface temperatures. The stars range from blue-white (hottest) to yellow-red (coolest). The temperatures can range from as high as 22,000 degrees Farenheit to 5,000 degrees. The best stars to study for this purpose would be Vega, Arcturus, and Spica. These stars are visible in the evening from late spring to early fall.

II. Magnitude:

The brightness of a star depends on the temperature, size and distance to the earth. Two of the best constellations to study for this are the big and little dipper. All of the stars in the big dipper are of second magnitude except the star where the ladle and handle meet which is third magnitude. All the stars in the little dipper are between third and fifth magnitude. The lower the magnitude, the brighter the star.

III. The Milky Way:

All the stars that one sees belong to the milky way. The milky way is really made up of over 100 billion stars and is also called a galaxie. The milky way is one of several million galaxies known to exist in our universe. However, the term milky way often refers to a hazy patch of the night sky. To the ancient Greeks the milky way represented a road to the heavens. The milky way is approximately 100,000 light years across and 20,000 light years thick. Our sun is located near the middle of the galaxy.

IV. Constellations:

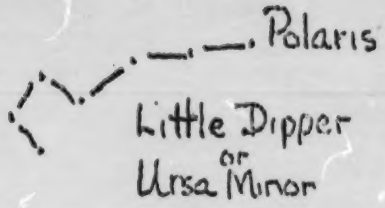
A. Big Dipper:
The big dipper is the most readily recognized of all the constellations. This constellation is also known as the big bear. In the summer the constellation is high in the northern sky and in the winter it is in the lower sky.

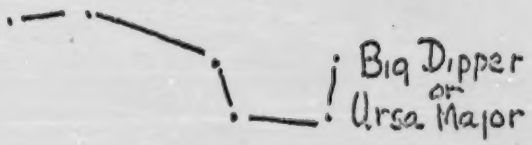
B. Little Dipper:
The little dipper is recognizable in that the north star (Polaris) is the tip of the handle of this constellation. The little dipper is not as bright as the big dipper in that its stars are of the third to fifth magnitude. The two dippers always look as though they are pouring into each other.

V. Stars:

A. Polaris:
To find the north star, follow the pointer stars of the big dipper to Polaris which is a second magnitude star. Polaris is only visible north of the equator. In the northern hemisphere Polaris is used for navigation. Its altitude is equal to the observer's latitude.

BEST VIEWING TIME:
Big Dipper--any time
Little Dipper--any time





A long time ago there was a mortal woman who had a son. Now the wife of Zeus was very jealous of her so she changed the woman into a bear. The first thing the bear then did was go to the forest to live. One day after the son grew up he was hunting in the forest. The first animal he saw was the bear which was his mother. Of course he didn't recognize her. Just as he was about to kill her, Zeus saw what was happening and changed the son into a bear cub and sent both bears to live in the heavens for the rest of their lives. They became Ursa. Major and Ursa Minor.

Zeus favored them by placing them in a portion of the sky where they will never dip into the Western ocean. Not only that but Zeus disguised the two bears so that his wife would not recognize them. Zeus did not want them harmed! So my cherubs, as you look in the sky for the Great Bear or the Little Bear find the dippers and then add stars until you find the bears. Mortals agree that the handle of the Little Dipper is the tail of the Little Bear. However, Zeus so cleverly disguised the Great Bear that mortals have never decided if the tip of the handle of the Big Dipper is the Great Bear's nose or the tip of her tail. So don't fret, my pet cherubs, if you can't find all of the bears--Zeus did not mean for you to recognize them! And that my cherubs, is the true story of how Ursa Major and Ursa Minor came to be in our heavens.

Now, my favorite cherubs, would you like to hear the story that the ancients liked to tell? They never talked about them being bears in disguise, they liked to relate a yarn about them as dippers. If you don't want to read a make-believe story then stop here, my dear cherub!

Many, many years ago--so many in fact that your great, great, great, great, great, great, great, great, great, great grandfather was not even thought of--there lived a little girl named Estella. She was the kindest, sweetest, gentlest girl that ever lived. No one ever knew her to be unkind or cross to anyone or anything.

One day two gods got to talking about how no mortal was all good-everyone of them had some sort of meanness in them. A goddess was listening to them and finally she told them they were wrong. Now, my

cherubs, no one--not even a goddess--can tell a god he is wrong. So they told her to prove it. Now this goddess knew Estella and so she caused certain things to happen to prove Estella's goodness; the two gods watched closely looking for anything at all to prove there was at least a thought that was mean.

Now you must know, my cherubs, if Estella was good she must have loved her grandmother very much. First the goddess made the grandmother be cross and mean to Estella. Estella could not understand why so suddenly her grandmother was cross and mean but she did not treat her grandmother that way in return. Instead Estella tried to do more for her grandmother and loved her even more. Next the goddess made the grandmother very ill. She was burning up with a very high fever. The grandmother told Estella that she had to have a cool drink from the stream. Now my cherubs, that stream was thru a deep-dark forest. Estella knew there were animals living there which could hurt her but she did not hesitate or even think a mean thought about her grandmother or any animal that might attack her.

On the way back from the stream wiht her dipper of water, she came across a poor dog eho had a hurt paw. She could not pass the poor , injured dog without stopping to help even tho she was in a hurry. So she rinsed the wound with a little of her water, tore a piece off her slip and bandaged the wound.

Next Estella came across a lynx lying by the side of the road. It was easy to see it was dying from thirst. Now, my cherubs, you remember a lynx can be a very mean animal and would have no hesitatation at all to hurt a mortal. Estella knew this but she had to help anyway- so she gave the lynx wnough water so he could continue on his own to the stream.

About one half her water was gone. The gods had not discovered even a brief thought of unkindness or cruelness. But they told the goddess that after all, they weren't true tests because Estella did have water left for her grandmother. So this time the became an old man on crutches. When Estella came upon the old man her heart went all out for him. He first demanded that Estella help him because the way was so rough. Now you must remember Estella was in a hurry but ever so gently she helped the old man. Next the man wanted a drink. Estella told him he could have half of it. Slowly the man drank the water and didn't stop when he had drank half of it. In fact, he drank it all! Poor Estella! But she didn't have hard feelings, she just took the dipper and started back to get some more water.

But poor Estella's troubles were not over, she tripped and fell. She was so bewildered because as the dipper left her hand it started to shine and rise up into the sky to become the Big Dipper. She then saw the dog which rapidly turned into the lynx, which rapidly turned into the old man, which rapidly became the goddess. Behind the goddess appeared the two gods. Imagine, my cherubs, how surprising all this would be to Estella!

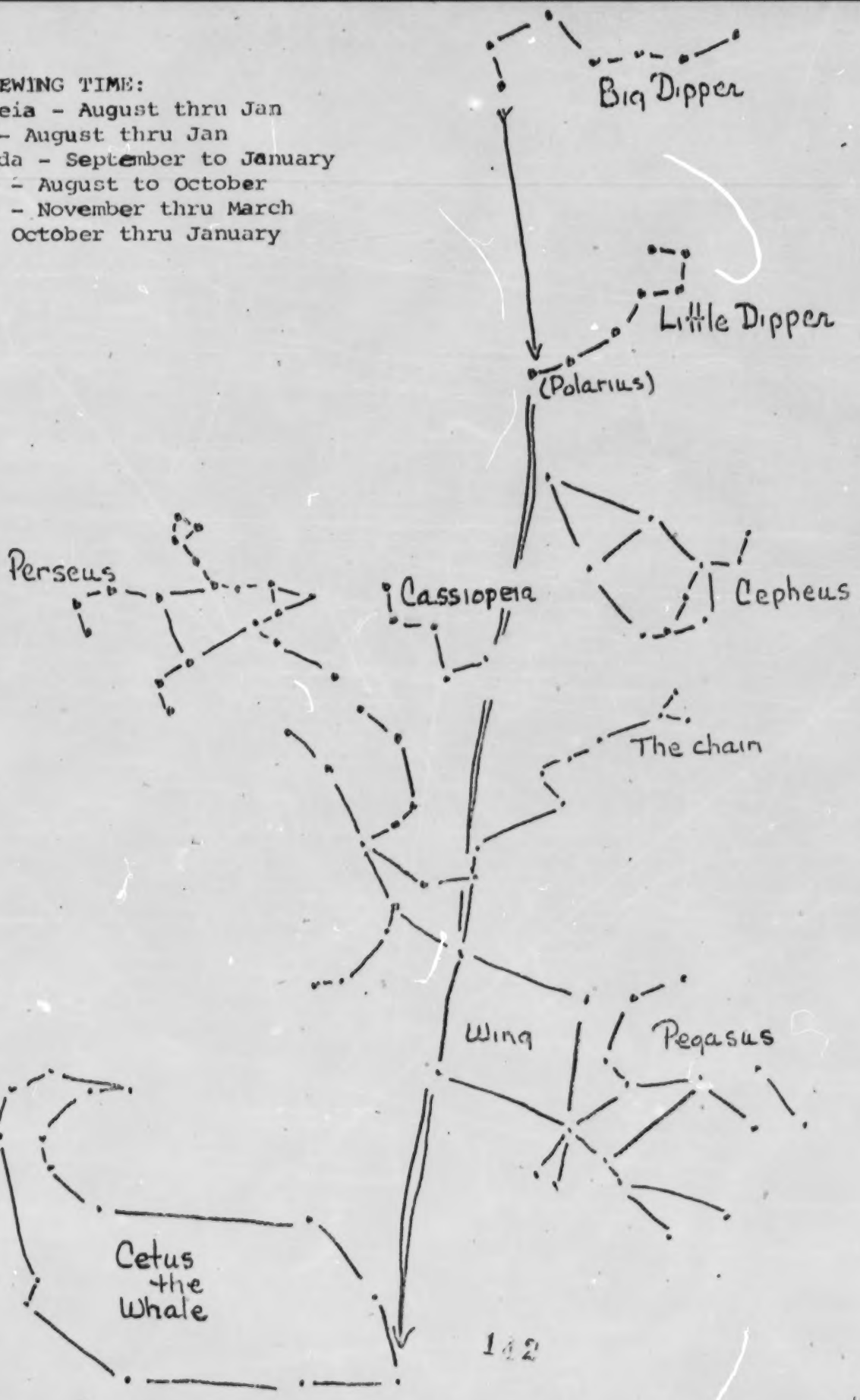
The two gods had finally agreed with the goddess that this was one mortal who had no unkindness or meaness in her. They told Estella because she was so kind and gentle that she had a dipper at her place that would never run out of water.

Estella arrived at home and found the dipper with the coolest, sweetest water anyone had ever tasted. Estella gave her grandmother a drink of the water and immediately she was well again. The dipper never ran out of water all of Estella's life. When Estella died the

dipper flew up into the sky to join the other dipper.

And THAT, my dear romantic cherubs, is the make-believe story the ancients liked to tell!

BEST VIEWING TIME:
Cassiopeia - August thru Jan
Cephus - August thru Jan
Andromeda - September to January
Pegasus - August to October
Perseus - November thru March
Cetus - October thru January



142

Many, many years ago--longer than one can even imagine, my young Cherubs--there lived a very beautiful queen called Cassiopeia. She had a husband named Cepheus. He was a gentle, quiet man who loved Cassiopeia very much. Because Cassiopeia was such a proud woman, Cepheus stayed just a little behind her so people would not notice him before Cassiopeia.

Oh, how proud Cassiopeia was of her beauty. She wasn't happy to just let people look at her and enjoy her beauty. She had to keep telling everyone how great her beauty was. She even claimed to be prettier than the sea-nymphs. Now the sea-nymphs were the daughters of Poseidon, the God of the Seas, and they truly were beautiful, the most beautiful creatures alive. They didn't like having Cassiopeia saying she was prettier than they were. So the sea-nymphs persuaded their father Poseidon to punish Cassiopeia. Poseidon sent a sea-monster, Cetus the Whale, to destroy the coasts of the land of Queen Cassiopeia and King Cepheus. The only thing that would save the land was for Andromeda, Queen Cassiopeia and King Cepheus' daughter, to be given as a sacrifice. So poor, sad Andromeda was chained to a rock at the edge of the sea. Andromeda had only a short time to live for Cetus was on his way!

Luckily flying overhead on Pegasus, a flying horse, was a young man named Perseus. Perseus was on his way home after removing the head from Medusa. Now Medusa was a horrible woman-monster who had snakes instead of hair on her head. One look at her turned the viewer into a stone statue. The fact that Perseus had Medusa's head in a pouch on his belt proved he had to be a brave and clever young man. Anyway, Perseus saw the pretty Andromeda chained to the rock and the Whale moving straight for her. After Perseus heard Andromeda's sad story, he killed Cetus. After Perseus slayed Cetus, he freed Andromeda and the two flew away on Pegasus. They were married and two happier people could be found nowhere.

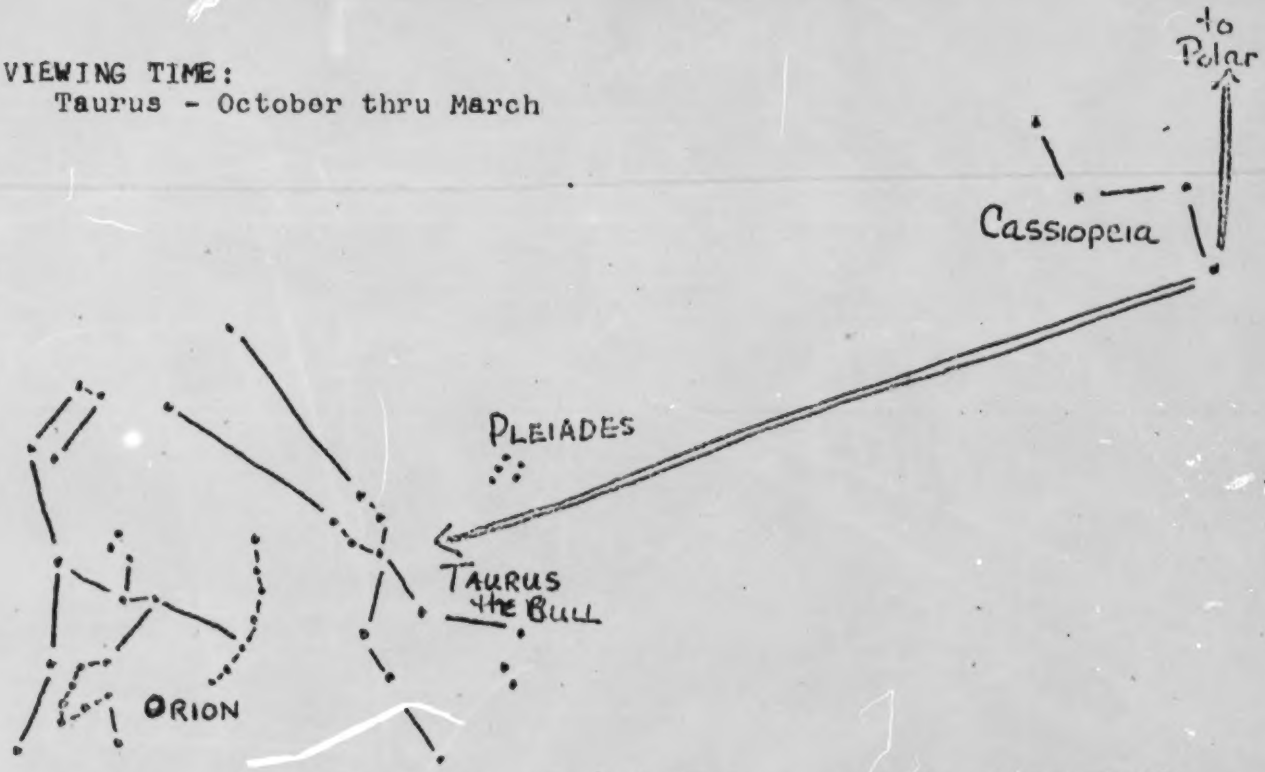
Poseidon was angry because his sea-monster was slain. And the more he saw Perseus and Andromeda being happy the angrier he became. Finally Poseidon turned back time before Cetus was slain and sent them all to live in the skies until the end of time! And my little cherubs, since the end of time had not come yet, you can still see Queen Cassiopeia, King Cepheus, Cetus, Andromeda and Perseus there in the skies of the north.

Cassiopeia Cepheus Cetus

Poseidon Cassandra Medusa

Sea Nymphs Perseus

BEST VIEWING TIME:
Taurus - October thru March



My little cherbus, Zeus, the King of Olympus, ever so often visits earth in an odd form. One day Zeus saw a beautiful maiden named Europa playing in a meadow. There were so many flowers that she had made a wreath for herself and a larger one for her mother. Just as Europa was leaving, a big white bull appeared. The bull, who was really Zeus, had his head down as if he wanted the wreath put on his horns. Europa put the wreath on the horns, the bull then tossed her up over his head onto his back. They played in the meadow and then the bull took off heading for the sea. They traeled all over theworld. The Sea-nymphs on dolphins joined in the fun.

The area of land known as Europe was named after Europa to commemorate the joyful ride. Zeus had such sport that he sent a bull to live in the sky so he would not forget!

Even today Taurus the bull plays in the skies. The six sisters, the Pleiades, ride around the sky on Taurus. You can tell they are having lots of fun because of the way the Pleiades twinkle and shine.

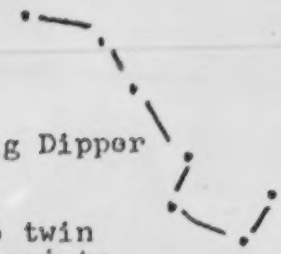
Pleiadeus

Zeus

Europa

Taurus (the bull)

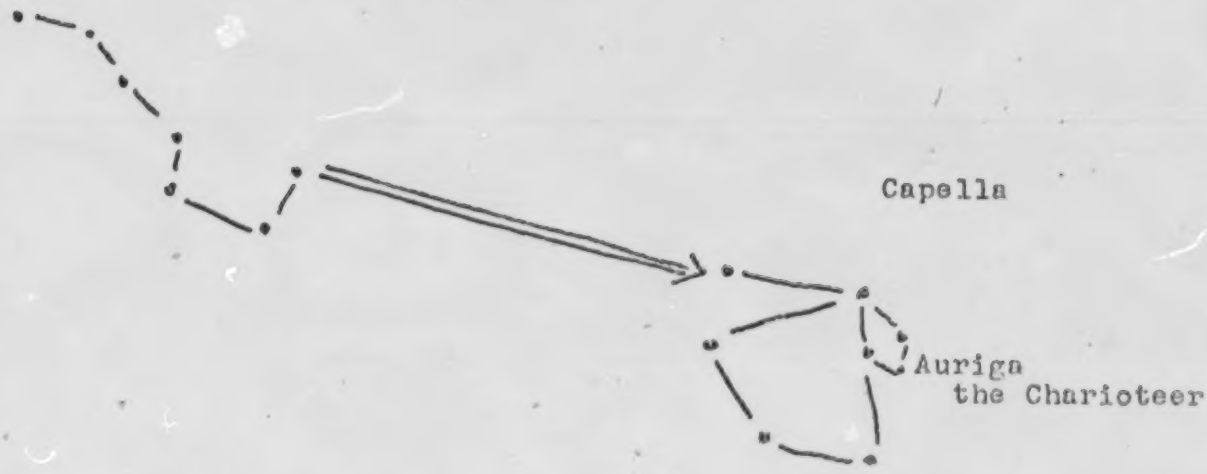
BEST VIEWING TIMES:
Castor and Pollux -
December thru May



Castor and Pollux were twin brothers and were brave Argonauts. Now my bright cherubs, I'm sure you remember there was a ship called the Argo and it carried brave men all over the sea area and when they came to a land where there was a mean, cruel king or wild monster, they killed the king or monster and freed the people. The men or the ship Argo were called Argonauts. Do you remember the story of the Golden Fleece? That is another story, but there was an Argonaut that captured the fleece and as they were returning the Golden Fleece to Greece, a terrible, mighty storm came up which seemed apt to sink the ship. One of the Argonauts named Orpheus played a prayer on his lyre to Apollo to save them. Apollo sent two stars to shine, one on the forehead of Castor and the other on the forehead of Pullux. These were magical stars, the instant they appeared the storms ceased. The stars never left the foreheads of the twins. When they got older their youth was returned to them and they went to live in the heavens so that they could continue to guide ships to safety with the stars on their foreheads.

Let me warn you, if you hear people talk about "The Twins" of Gemini (which means twins) they are referring to Castor and Pollux -- more than likely they don't even know that that is their names. But you, my smart cherubs, will not forget their names, will you?

BEST VIEWING TIME:
Auriga - October thru April
Capella - October thru April

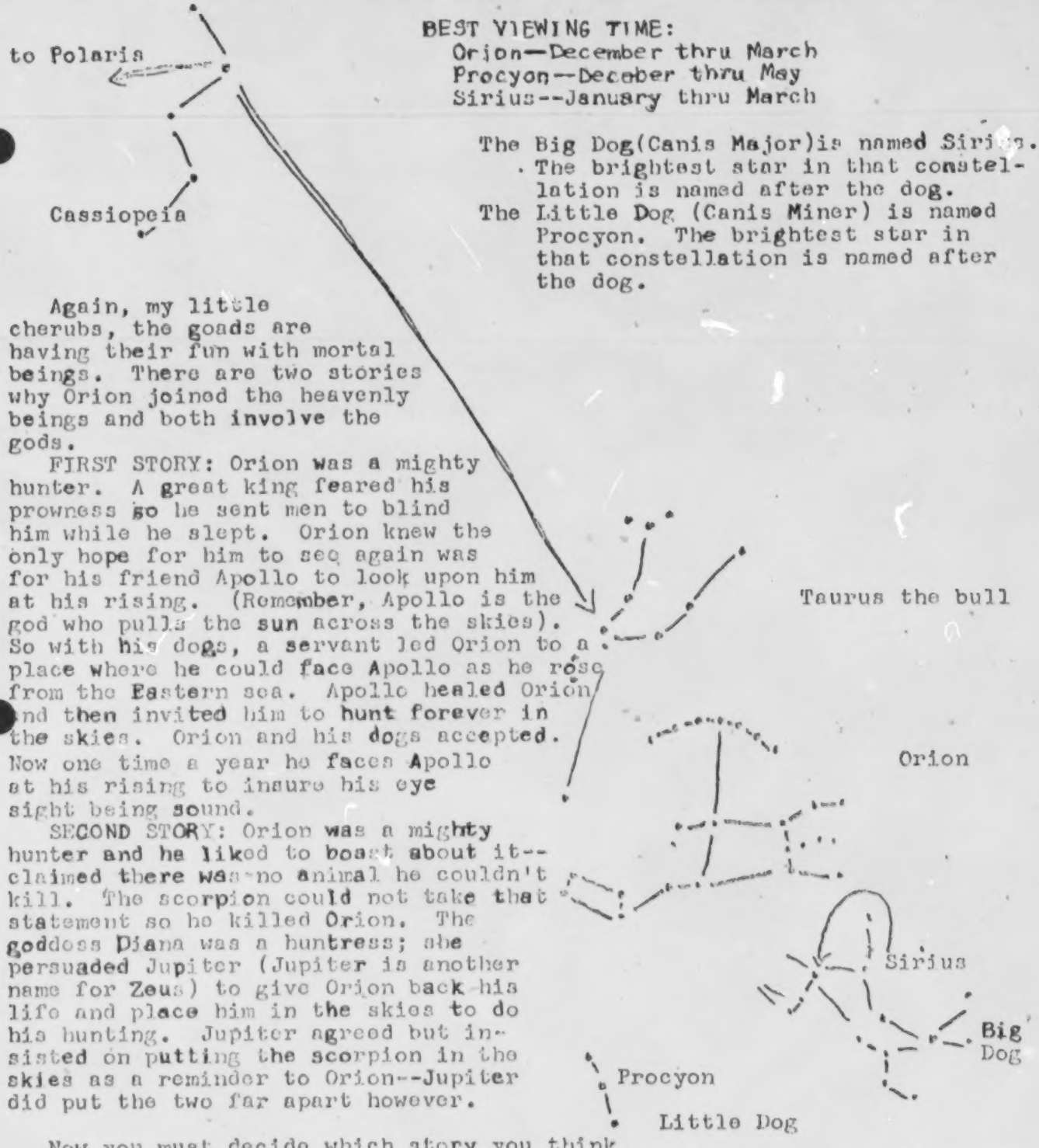


Capella, the nanny-goat, is a bright star that serves as the eye of Auriga (o ri ga), the Charioteer.

Once many years ago, when Zeus was a baby, Capella was just a mere nanny goat who lived on earth. Now you know Zeus is the ruler of all gods, King of Olympus, so you can see it has been enough years ago that you can not remember. When Zeus was a tiny, new baby his life was so much in danger that his mother had him hidden in a cave with a goat for a nurse. Soldiers were encamped just outside the cave and were kept constantly practicing all sorts of noisy military manoeuvers. The noise from the maneouvers covered any noise the baby might make. Zeus never forgot Capella and when he became king of Olympus, Zeus placed her in the heavens. Why Zeus chose to have Capella part of Auriga the Charioteer only Zeus will ever know. You see, mortals never question the Gods.

The chariot was a marvelous invnetion. It evabled man to travel in a more comfortable manner and it proved to be a big addition to the armies. Because the chariot was such a great development of man, Auriga, the professional charioteer, was placed in the sky to commemorate it.

Capella Zeus Auriga
Olympus charioteer



BEST VIEWING TIME:
Orion—December thru March
Procyon—December thru May
Sirius--January thru March

The Big Dog(Canis Major)is named Sirius. The brightest star in that constellation is named after the dog.
The Little Dog (Canis Miner) is named Procyon. The brightest star in that constellation is named after the dog.

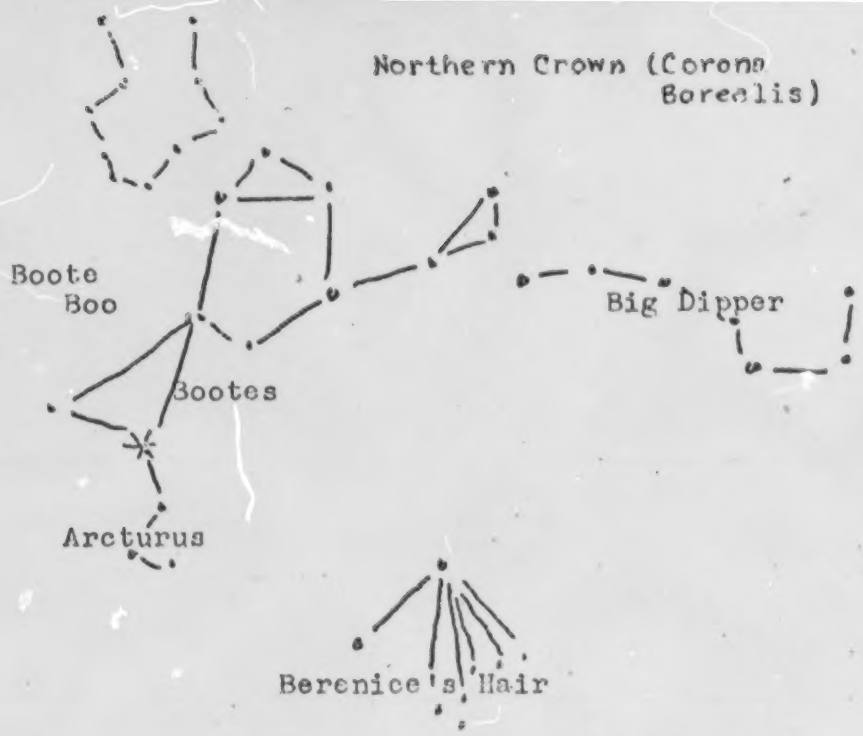
Again, my little cherubs, the goads are having their fun with mortal beings. There are two stories why Orion joined the heavenly beings and both involve the gods.

FIRST STORY: Orion was a mighty hunter. A great king feared his prowness so he sent men to blind him while he slept. Orion knew the only hope for him to see again was for his friend Apollo to look upon him at his rising. (Remember, Apollo is the god who pulls the sun across the skies). So with his dogs, a servant led Orion to a place where he could face Apollo as he rose from the Eastern sea. Apollo healed Orion and then invited him to hunt forever in the skies. Orion and his dogs accepted. Now one time a year he faces Apollo at his rising to insure his eye sight being sound.

SECOND STORY: Orion was a mighty hunter and he liked to boast about it--claimed there was no animal he couldn't kill. The scorpion could not take that statement so he killed Orion. The goddess Diana was a huntress; she persuaded Jupiter (Jupiter is another name for Zeus) to give Orion back his life and place him in the skies to do his hunting. Jupiter agreed but insisted on putting the scorpion in the skies as a reminder to Orion--Jupiter did put the two far apart however.

Now you must decide which story you think is true. Don't fret that the gods are laughing at you in your confusion, they need their sport now and then and really this is a safe sport for mortals--sometimes the gods' sports are not so tame and harmless.

BEST VIEWING TIME:
Bootes - April thru August
Northern Crown - April thru August
Bernenice's Hair - April thru August

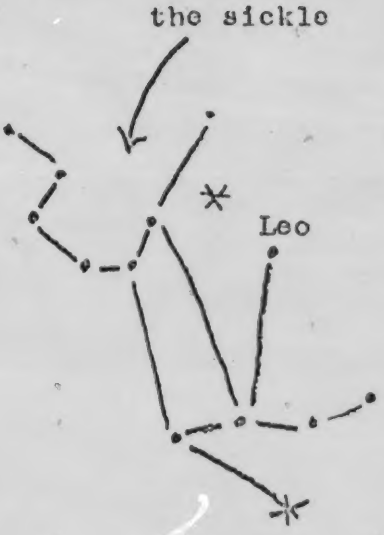


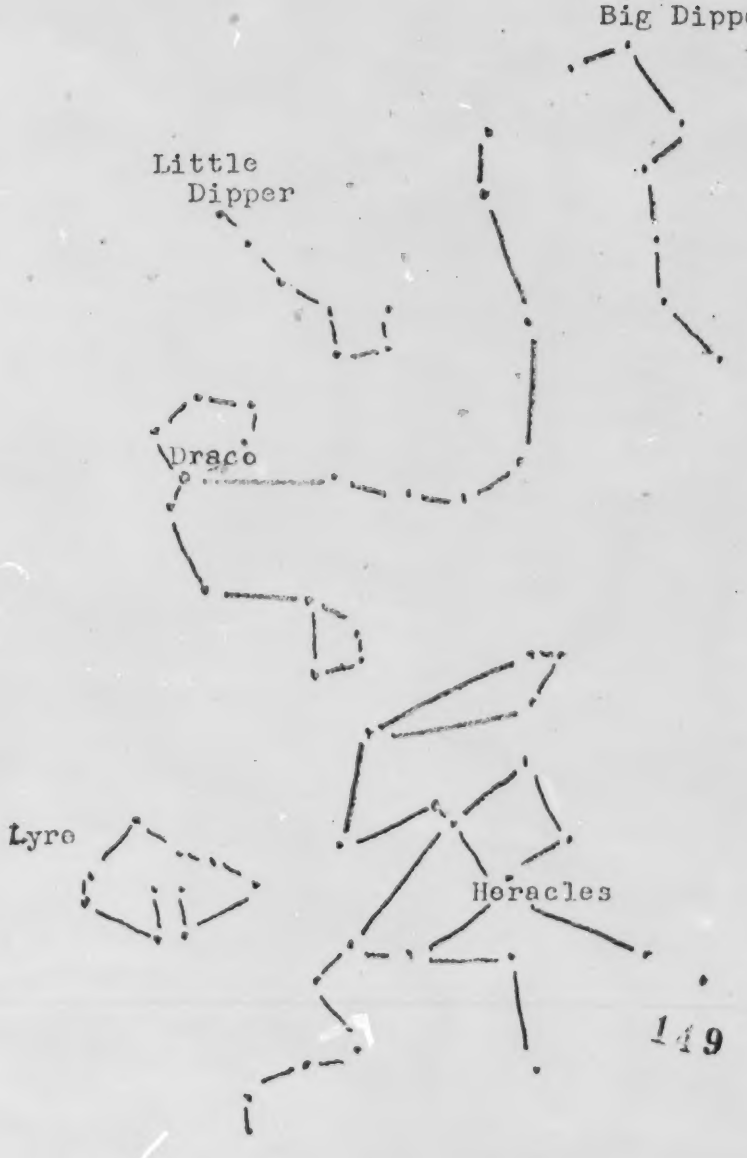
Bootes, the Herdsman, is a constellation about which mortals are really confused. You know Zeus only allowed special people and things in the heavens and Zeus has kept Bootes secret well. Mortals call him a herdsman who is sitting smoking his pipe. Yet Zeus has rumored that he might be a ploughman stirring up the field of heaven with a Great Plough also that he might be a hunter with two of his dogs. We do know that Bootes is important enough for Zeus to give him a jewel to keep-Arcturus.

Have you ever wondered why the Northern Crown, sometimes called the Corona Borealis, is in our heavens? Listen to this story. Once upon a time ever so long ago, a very beautiful maiden named Ariadne was left stranded on a desert island. As she sat there weeping she heard a very gentle voice telling her not to cry, he had a crown for her to wear. When Ariadne looked up she saw the god Dionysus (or Bacchus if you prefer his other name). He told Ariadne the crown was hers if she'd marry him. They were married and she wore the crown until she died. Zeus placed the crown in the heavens so no one would forget the beautiful love that Dionysus and Ariadne had for each other. You see, Zeus had a very romantic heart though he tried to keep it hidden most of the time.

Berenice was the very sweet and kind Egyptian Queen of King Euergetos. Now an invading army came into their land and King Euergetes had to meet it and fight. Queen Berenice was very sad and anxious and wished to do something to ensure her husband's safe return. Now Queen Berenice had very beautiful golden hair so she cut it off and offered it at the alter to the gods. The gods were so pleased they sent King Euergetes back to her safe and sound. Zeus even put her beautiful crown of golden hair in the heavens as a symbol of divine approval of self-sacrificing love. That is why there is such a strange thing as a crown of hair in the heavens.

BEST VIEWING TIME:
Leo - February thru June
Heracules - May thru October





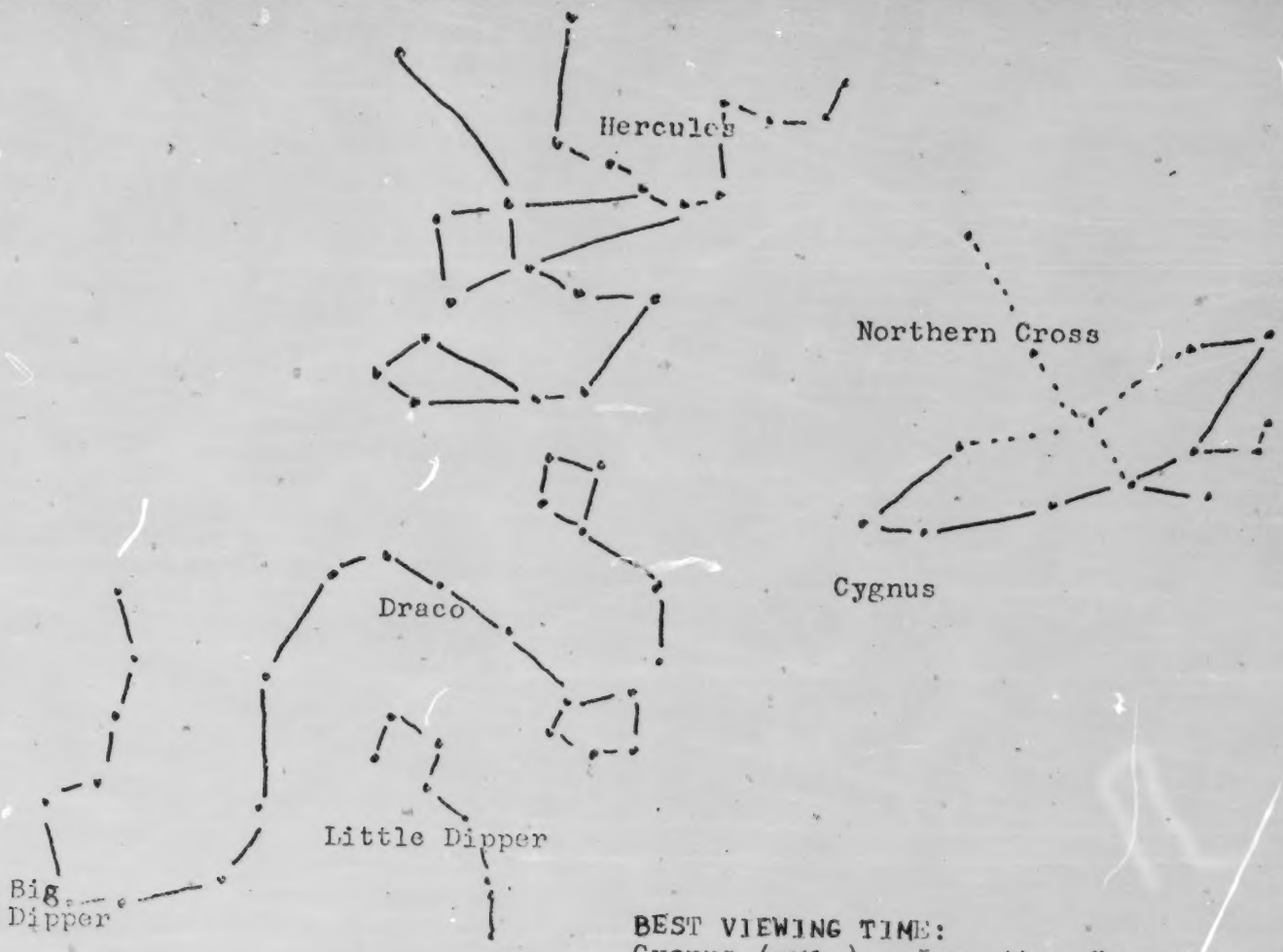
One of the greatest heroes of all times was Heraculcs. There are many tales about the great things Heracules did. He sailed in the ship Argo with Castor, Pollux and Jason and other great heroes. Heracules even went to the grave and conquered death--he brought back for a friend, the friend's dead wife. Heracule's strength was so great even as a baby that he killed two snakes who were sent to squeeze him to death. All his life Heracules did great deeds of strength in order to help other people. So let me tell you about two things he did. One is about Draco of the Heavens and the other is about Leo of the Heavens.

Heracles was sent to the Garden of Hesperides to bring back a golden apple that grew there. The only person who could get to the garden was a giant named Atlas. So Heracles did Atlas' work (holding the earth in the sky) for him while Atlas got the apple for Heracles. The apples were guarded by a big dragon. When Atlas came, all the dragon could see were the legs of Atlas so he attacked them. Atlas didn't even pay attention to the dragon and left with 3 apples, leaving the dragon behind. Because of the failure of the dragon to stop Atlas he twisted and turned so much he ended up in the sky. Even today, you can see Draco the dragon twisting and turning between the two dippers. There is to be no rest for Draco until the apples are returned to the Garden of the Hesperides.

In the forest of Nemaea there was an usually large and fierce lion. People were really fightened of the lion; they were even afraid to go out their doors. Even all the hunters were afraid of the lion. Heracules heard about the lion and felt sorry for the people. So Heraculcs hunted the lion down and killed him. Heracules wore the lion's skin from that day forth. Zeus was so pleased about Heraculcs progess that he placed the lion in the sky so eveyone could know of Heracules greatness. But you know this, people were still afraid of Leo. In fact for ever so long they did not even like to recognize Leo; they always referred to the sickle which is the head of Leo. They felt safer that way.

You have heard music, but have you ever heard music that could make rocks melt? Or that make trees pull their roots from the ground to follow the music? Or that makes savage lions purr like a loving kitten? Or that makes you forget everything but the music, even if you are in a burning house? No, my precious, music has never been played like that except by Orpheus on his lyre. Orpheus lived in Thrace so many years ago that the land of Thrace exists no more. When Orpheus' beloved wife Eurydice died, he was so sad he decided to go to Pluto in Hades to get her back. (Now don't forget, Pluto was the god of Hades--Hades being underground where the dead go.) Orpheus encountered ghosts, dragons, beasts, etc. as he went deeper and deeper underground but nothing harmed him because they succombed to the music Orpheus was playing.

When Orpheus finally reached Pluto's place, Pluto told him to leave and take Eurydice with him--his music you see, was upsetting Pluto's kingdom of Hades. Pluto warned Orpheus that not matter what he was not to look back until after they had left Hades because if he did he would loose Eurydice forever. Well, they were almost out of Hades when Orpheus could not hear Eurydice's footsteps any longer. Without thinking he looked behind him and he saw Eurydice fall away from him. Orpheus was so sad and he soon died. When he died the lyre went to the heavens because he had been such a great maker of music. Sometimes on a very bright and beautiful night the music of the lyre can be heard ever so faintly by lovers and they can be sure their love will last forever. So is the power of the magic of the music of the musical lyre of Orpheus.



BEST VIEWING TIME:
Cygnus (swan) - June thru November

Cygnus, the son of Poseidon (the god of the sea) was one of the great warriors who helped Paris defent the city of Troy against Achilles. Achilles and Cygnus met in battle. Achilles threw his spear at Cygnus and hit his breast plate. Now normally this meant the end of Achilles' foe but Cygnus went on as if nothing happened. Then they fought with swords. Achilles won. When Achilles' squire took off Cygnus' armor it was empty. Above them in the blue sky sailed a large bird on its way to the big River of Heaven. (Milky Way) Poseidon loved his son too much to let him die and by making him a swan, Poseidon could forever have his son with him. That is one story of Cygnus.

Another is that Apollo was the god who pulled the sun across the sky each day. The sun chariot was drawn by great horses. One day Phaeton, Apollo's son, talked Apollo into letting him take the sun chariot. Now, Apollo knew he shouldn't but finally he agreed to let Phaeton do it. Phaeton could not control the horses and they ran wild. They got too close to earth and started fires, dried up rivers and Zeus was afraid earth would be destroyed so he sent a bolt of lightening, knocked Phaeton from the chariot and he fell into the River of Heaven and drownd. Now a friend of Phaeton's dived into the river to try to save Phaeton. Zeus was watching; thought the friend looked extremely funny as he dived - a lot like a swan putting his head under water. So he changed the friend into a swan to swim the river until the end of time. Now which do you believe to be the true story?

SUCCESSION

These items will be needed to successfully complete a succession trail. Pen or pencil, paper, something hard to write on, ground thermometer, air thermometer, magnifying lens, various nature guides (Tree finder, flower finder, bird guide) and a curiosity about the world of nature.

This trail will give one the opportunity to exercise all of their senses and to observe those subtle changes that are continually occurring around us but are so seldom notices and appreciated. This nature trail should give you a chance to put your knowledge to work in reading m natural clues and in making predictions about the future.

STATION 1 -
Study a tree without actually touching it. Observe the leaves on the lower part of the tree and compare them to the leaves on the upper part of the tree. Can you figure out why this tree has different types of leaves on it? Be sure you observe the entire tree including the trunk! Can bark of a tree be useful in identifying a tree? Notice the ground cover of this area. Point out two different types of ferns here. Once you have found them, write down a description for one of the ferns or draw a picture of one.

STATION 2 -
Look for a rotting stump. How long do you think this stump has been decaying: Can you find any forms of life that are taking advantage of this decaying matter? How many different forms of life can you spot here? Don't be afraid to touch it. Push away some of the litter and see what you can find. How do you think the different forms of life are affecting this stump? Do you think this stump will be as visible next year as it is now? Before going on, stop and take the air temperature in an area near the stum. Record your findings.

STATION 3 -
Tree with an unusual bend in the trunk. Can you think of a good explanation for this bend. It might be helpful to think a minute about the basic needs of green plants. Look at the area surrounding the tree for some clues. Remember the environment around this tree may have changed a little since the bend was formed. What is the tree competing for?

STATION 4 -
Soil Profile find an exposed area so that you can examine a smooth surface. Notice the colors of the various layers in the soil profile. Measure the thickness of each layer and describe its colors. Include the layer of litter at the surface if any is present. Do you see any roots growing through the soil? At which layer are they most visible? Do you see insects present at all the layers of the profile? Describe the different layers in terms of moisture, hardness, and compactability. Take the air and soil temperatures. Record them.

STATION 5 -
Edge of a field. Now you are at the junction of the forest and the field, and we can begin to examine how succession proceeds after a farmed area has been allowed to grow wild. Since succession is a series of changes in the types of plants in an area, what do you think caused the difference between the forest and field plant communities? A plant community is all of the plants that live in a specific area. Write down whether you think it will be hotter or cooler in the field and whether the humidity will go up or down? Is there a difference in sunlight and shade? What might this cause in the succession of plant types? Will there be a difference in the soil profile between the forest and field? Why? We will find the answers to these questions in a little while

Forest		Field
Shade	Sunlight/Shade	Sun
Cooler	Air and soil temperature	Hotter
Higher	Humidity	Lower
More	Soil nutrients	Less

Look at the two areas. Which has the largest amount of living plant materials? Which has the largest plants? Which area looks like it has more different kinds of plants/ By thinking about these questions you should be able to guess which area has been growing longer and is more like what all the land around here would look like it if were allowed to grow wild.

STATION 6 -
Field. Look into the field and try to see as many different areas as you can. What are the differences? How many are There/ Color, visual texture, plant types, plant types within each area, plant height. What do these differences tell us about the plants? It shows us that different plants grow

in different areas. These are called plant communities.)
Why are there different communities in the field?
You should be able to see at least five different communities. You are standing in a field that used to be farmed. The field was allowed to grow wild except for the area of tall grasses that grows to show us what a tall grass prairie looks like. This area has been left alone. An area of grasses should be visible as well as clover and a few young trees and srubs.

This field is an example of secondary succession. It is an area that already has soil formed and was once disturbed by man. When the field was farmed only the crops planted were allowed to grow and all the other plants were killed by plowing or spraying. When the farming was stopped the wild plants (weeds) grew rapidly and began to dominate the area as the daisy fleabane is doing. Eventufally the young trees would have spread all over the field and the larger older ones would replace the young trees....but they would be a different kind of tree (oak and hickory as you saw back in the woods).
Take and record air and soil temperatures. Compare them with the two you took in the forest. Is there any difference/ Can you guess why? The air temperature is either the same or slightly hotter here in the field. This is because there are small open patches of ground and we are above the top of the plants, these reflect sunlight and heat back up. The soil temperature should be noticeably warmer here. That is because there is less hade and more sunlight is less shade and more sunlight is hitting the ground. Also the humidity was higher the water would evaporate and carry the heat away.

Now we can begin to understand how succession works. First the soil must be made by plants that don't need it in order to live. Once a little bit of soil is formed new plants can move in and replace the first ones. These new plants grow well where there is a lot of sunlight, low humidity and it is hot in the day and colder at night. As more of these kinds of plants (short weeds) grow they provide more shade,

and thus, higher humidity and lower temperature. This causes a further change in the plant communities, and taller, narrower plants are better able to live (grasses, tall weeds and thistles) Now there is a lot of shade on the ground, the humidity increases and the soil temperature is low. Also a lot of these plants are dying and increasing the top soil layer and providing more nutrients. If the plants are not cut down the wind and birds will carry in seeds of trees that can grow in sunlight. Eventually these trees will provide the right climate for the tall trees that you see in the forestto take over and produce a climax forest community.

Station 7 -
Continue to look around the field. You should notice a difference in the types of plant life growing as compared to the forest. See if you name four of these plants. There maybe thistle, mullein, red clover, yellow and white sweet clover, wooly milkweed and maybe a sumac. Most of these plants will be clustered in groups. Now look at the thistles, if they are present. Is there any difference in the thistles or do they appear to be all the smae kind? You should be able to identify two different kinds. Canada Thistles have the smaller more delicate looking heads. Bull Thistles are generally larger, have a thicker stalk and have prickly points on both the stalk as well as the leaves. Look around you now for signs of animals. It is possible that you will see grass near the forest edge that deer have flattened when using it for a bed.

STATION 8 -
This station demonstrates the secondary succession is progressing. We have a variety of "weedy" plants but they are slowly being invaded by the grasses. Part of this area may have been pasture. How many types of grasses can you find? You should be able to find Orchard Grass, Timothy, Brome, Sedge Grass.

STATION 9 -
Prairie grass. Now you are in an area of tall "prairie" grasses. Feel the long stems. See how they wave in the wind. Sit or lay down in the grass. Pretend that you are a deer. Really be quiet and listen. Can you hear the sound of the grass in the wind and the birds singing? What can you smell? Would this be a good place for deer to hide and sleep at night? How is this area different from the forest and the weeds? Can you see the soil? Is there more shade

on the ground here than in the weeds? Take and record the air and soil temperatures. The soil should be cooler here because of all the shade and the humidity should be higher than in the weeds. The tall grasses shade out the sunlight, they also have very extensive root systems which also crowd out other plants making it difficult for other kinds of plants to grow.

As you walk back into the forest sit down for a minute and compare your temperature readings.

On this walk you have seen that beginning dead trees and logs can have plants living and die and than create soil. That small, quick growing and whort-lived plants then take over, change the soil and microclimate and are replaced by taller and longer living plants. These then block out the sunlight and increase the humidity and lower the soild temperature and change the soil again. These in turn are replaced by trees that grow in the sunlight and eventually by shade tolerant trees forming a climax forest.

Thus we see that there is a constant theme throughout succession * CHANGE. Change in soil, plants, microclimate and wildlife. Even a climax forest will show some change, but it is very slow and hardly noticeable.

Now that you have seen stages of succession and the stages of succession from a field into a forest, let's review the differences that we can see between the young and mature stages. Guess which quality goes with the attribute and explain why you think so, this is in reference to the young and mature stages again.

ATTRIBUTE	YOUNG	MATURE
1. Living matter	smaller amount	larger amount
2. Size of plants	smaller	larger
3. Gross production of living matter	high	low
4. Plant diversity	low	high
5. Plant dominance	high	low
6. Stability	low	high
7. Life cycle	short/simple	long/ complex
8. Potential yield to man (over a period of time)	high	low

Think about how long it took for various stages of plant development to occur, about the types of plants that use to grow here.

LIFE CYCLE

Materials Needed: Food Chain Charts depicting life cycles of plants and animals

Life Cards: Cardboard approx. 1" by 2" with animal names printed on them
8 required per Herbivore
4 - Deer, 3-Fox, 2-Wolf

Shower Rings: To hold life cards

Magic Markers

Food and Water Cards: Approx. 1" by 4", 1 per herbivore

Markers or hats: To define carnivores

Proceedure: Discuss with group the life cycle of plants and animals using charts for illustration

After discussion the student is to take on the role of an animal and survive.

Each person is assigned an animal which he will be. He may be anyone of the below listed carnivores or herbivores. The participants also receive a varying number of life cards; herbivores generally get 8 or more each; carnivores receive 3 or 4. Carnivores receive markers, herbivores a blank food/water card.

The herbivores are told that to survive they must find as many food and water sources as they possibly can - the more the better. The sources are marked Food (or Water) and an orienteering punch is hung by each. Upon discovery the card is punched. The second thing that they must do to survive is to avoid becoming food for carnivores.

The carnivores are told that to survive they must get as much (only) as possible, but their food is the herbivores. Upon catching a herbivore (by tagging) the carnivore takes one of the herbivore's life cards, keeps it, and then goes on to get more.

All animals are also susceptible to certain elements such as disease, fire, drought etc. At least one person should be assigned to be one of these elements. The more animals there are participating the

more elements that can be introduced. Again, disease must tag the animal before receiving a life card.

The final threat to an animal's survival is Man. When man enters the game (5 to 10 min. before the games conclusion) word is passed among animals for man only has to see the animal to win a life card. He does not have to tag.

ADDITIONAL RULES AND AIDS

1. A) Foxes may not kill deer
   B) Foxes may not be killed by wolves

2. A) Carnivores may not catch the same herbivore twice consecutively. He must catch another animal in between.
   B) Carnivores may cooperate on a kill but only one may obtain the life card. Similarly a carnivore coming upon a recently captured herbivore may not take a life card until he has captured some other herbivore first.

3. All carnivores and diseases should be given an extra shower ring to collect cards on

4. Carnivores may only survive off their own life cards. They may not use those of their prey.

5. After playing this game a number of times many innovations may be added. For example, dividing all animals into male and female. The males are given the females life cards. Before the search for food may begin the pairs must find each other (symbolic mating) and exchange cards

TO START

1. Ensure each person is an animal and has a) their life cards
   b) a marker or Food/Water card

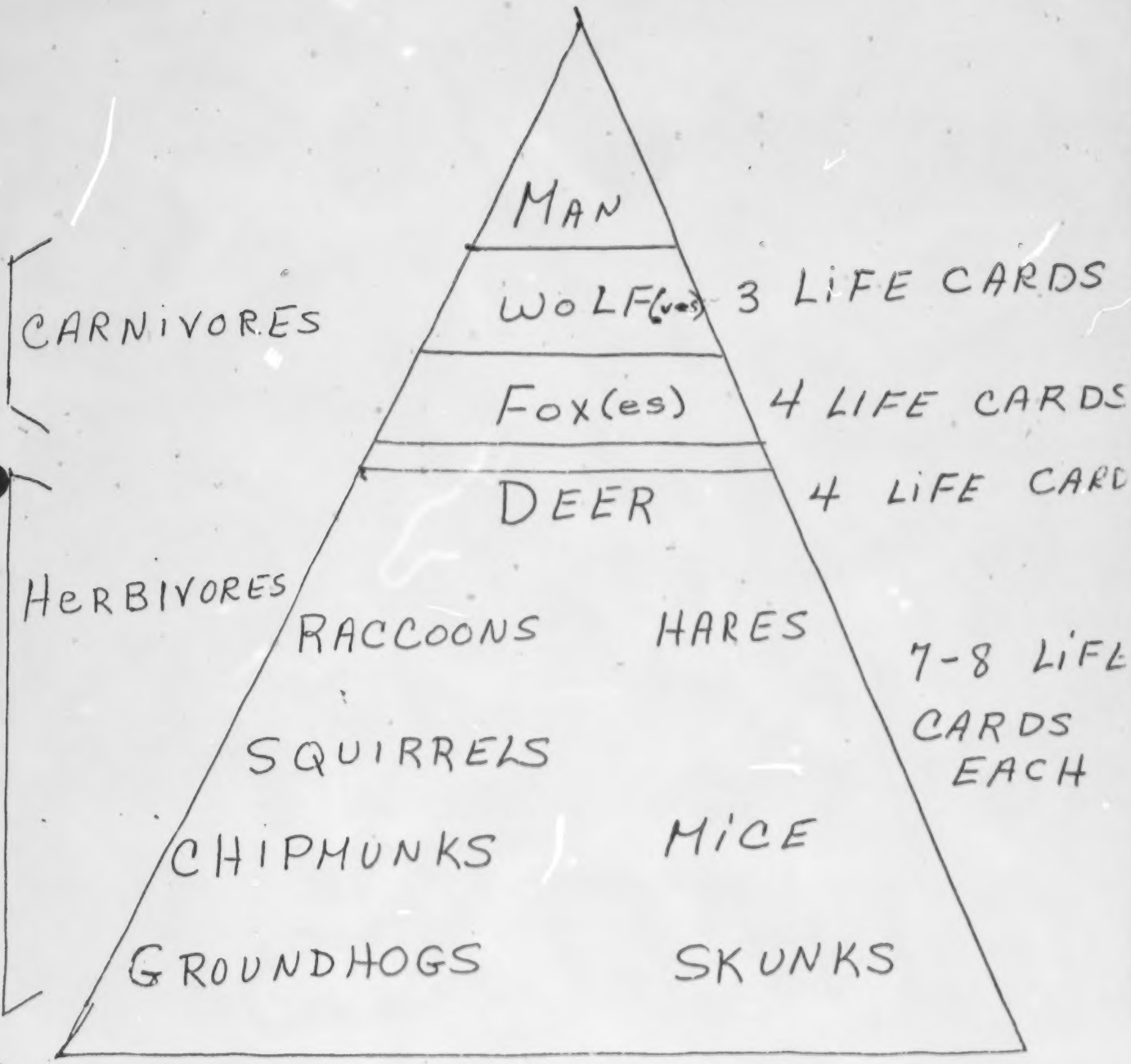
2. Define the boundaries

3. All herbivores to scatter first. Hold the carnivores, element(s) and man

4. Then in 3 or 4 minute intervals let the foxes, then the wolves, then disease, etc. go.

5. The game continues for an indefinite length of time. Man should never be in before the last 10 minutes. (The more life cards each animal has, the longer the game can be played.)

6. Have a follow up. How did you feel? What strategies did you use? What happened when man entered? Why does he only have to see to kill? How many were killed by natural predation? By disease? By man?



PLUS 1 ELEMENT DISEASE

Specific Activity: Energy, Food Chains, and Webs

Objective

Students will demonstrate their knowledge of energy-capture and transfer of energy through food chains by constructing a food web from examples present at Bluffville.

Learning Activity

Have the children sit in semicircles around the leader. The leader would then discuss the following terms with the students, using examples the children have seen at Bluffville.

Sun - original source of energy
Green Plants -- take energy, minerals, water, air and convert these materials to food. Green plants are producers, they are the only organisms that can convert the sun's energy so that it can be stored in food.
Consumers -- animals that live off plants or other animals
Predator -- animal that eats other animals thus getting a portion of that animal's stored energy
Prey -- animal that get eaten
Decomposer -- organism that breaks down material back into its essentials
Food chain -- show how energy is passed on from one organism to another
producer consumer predator
clover eaten by rabbit eaten by fox

Food web - more complex

These concepts can be taught by having children think of examples for food chains from the living organisms at Bluffville. By using cards to label producers, consumers, and predators each child could become part of web held together by string to show the energy transfer.

Materials needed: None at all, or cards, markers, and string.

Follow up -- Draw food webs.
Try to make a food web for everything that lives in an area such as the school ground.

Evaluation

Students will be able to build a food web using examples at Bluffville. Students back in the classroom will be able to draw a food web.

ANIMAL TRACKING

Materials:
1. pencil and paper for field use
2. 3 tin cans with plastic tops
3. strips of construction paper
4. 10 paper clips
5. plaster mix

Proceedure:

An exciting aspect of animal study is reading and preserving animal tracks. Begin with a discussion of where tracks a re likely to be found. Upon discovering a track, care should be taken so as not to damage the tracks. The following questions may be used for dis cussion and also to help stimulate interest and curiosity:

1. How long is the track?
2. How wide is the track?
3. How many toes on a forefoot?
4. How many toes on a hindfoot?
5. Is the track fresh or old?

(The questions a bove should be used when referring to single tracks. The questions below are for use with group tracks.

1. What direction was the animal traveling?
2. Was the animal walking or running?
3. Does the animal continue at the same speed?
4. What kind of food would this animal eat?

PRESERVING ANIMAL TRACKS

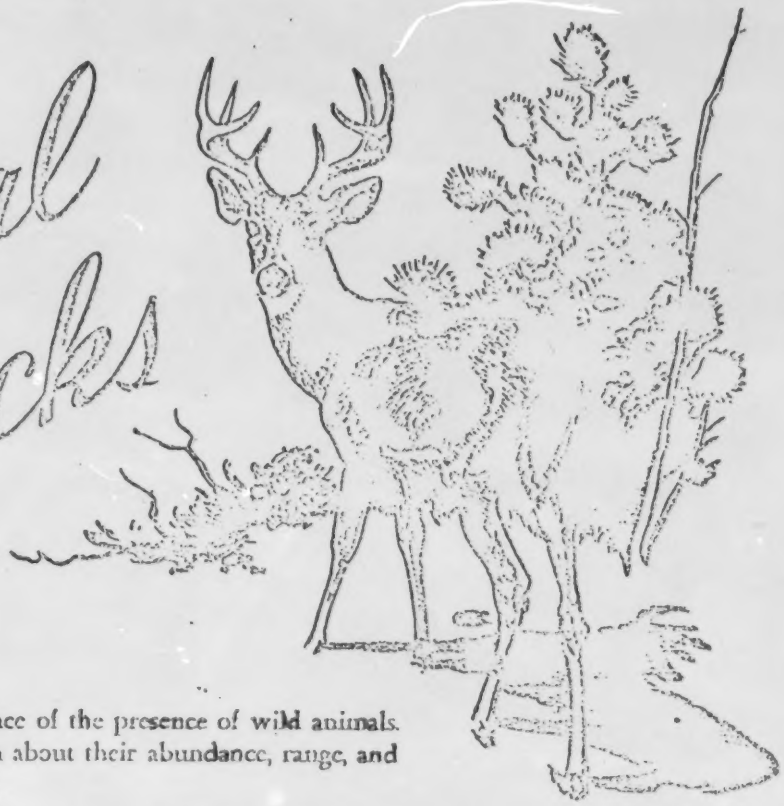
(Plaster Casting)

This lesson would be best taught in conjunction with the lesson mentioned on the previous page. Plaster casting is not only a fine learning experience but leaves the student with his own souvenier of his outdoor experience. The following steps, if followed, can lead to a successful lesson:

1. Select the track and position a strip of construction paper around it making sure the collar is tight to the ground.
2. Mix the plaster with water to a consistency similar to that of pancake batter.
3. Quickly pour the mixed plaster into the tracks (the plaster will begin to set within a few minutes)
   Tip: Sprinkle talcum powder on the track to keep the cast from retaining sand or mud.
4. Shape a paper clip to serve as a hanging hook and secure it into the back of the plaster.
5. Allow plaster to completely harden (1 to 4 hours depending upon the day) and remove slowly.
6. Clean the cast with paper clip or brush.

RUTH G. EDWARDS
COE E. FELLOWS ST.
DIXON, ILL. 61021
PHONE (815) 284-3619

Animal Tracks



TRACKS are often the only evidence of the presence of wild animals. Such tracks can provide information about their abundance, range, and habits.

The majority of such animals are most active during twilight hours or at night, a principal reason why they are not seen more often.

To "know" an animal is to know the location of his home, his food, his enemies, and his habits.

Tracks are a record of activity and by close study an observer can become intimately acquainted with an animal without ever having seen it.

Tracks of many animals are similar in appearance; for instance, the tracks of dogs, foxes, coyotes and wolves. It is a help in the identification of such tracks to know which of these animals frequent the locality in which the tracks are found.

Tracks are best observed after rains, as in mud along stream banks, or following light falls of wet snow.

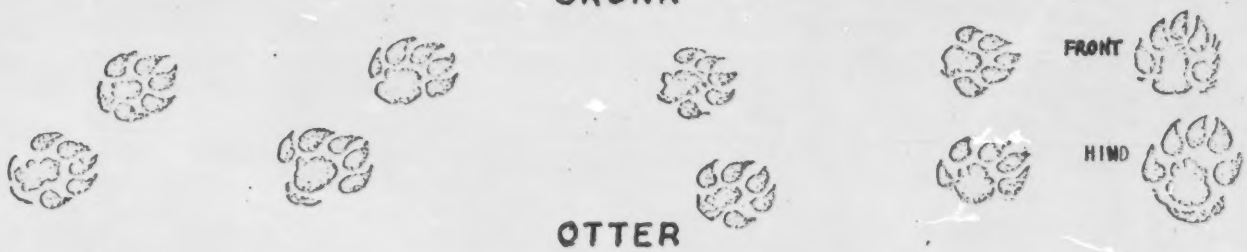
Tracks shown on the following pages are more perfect than are usually found under natural conditions.

SHORT-TAILED SHREW

WEASEL

MINK

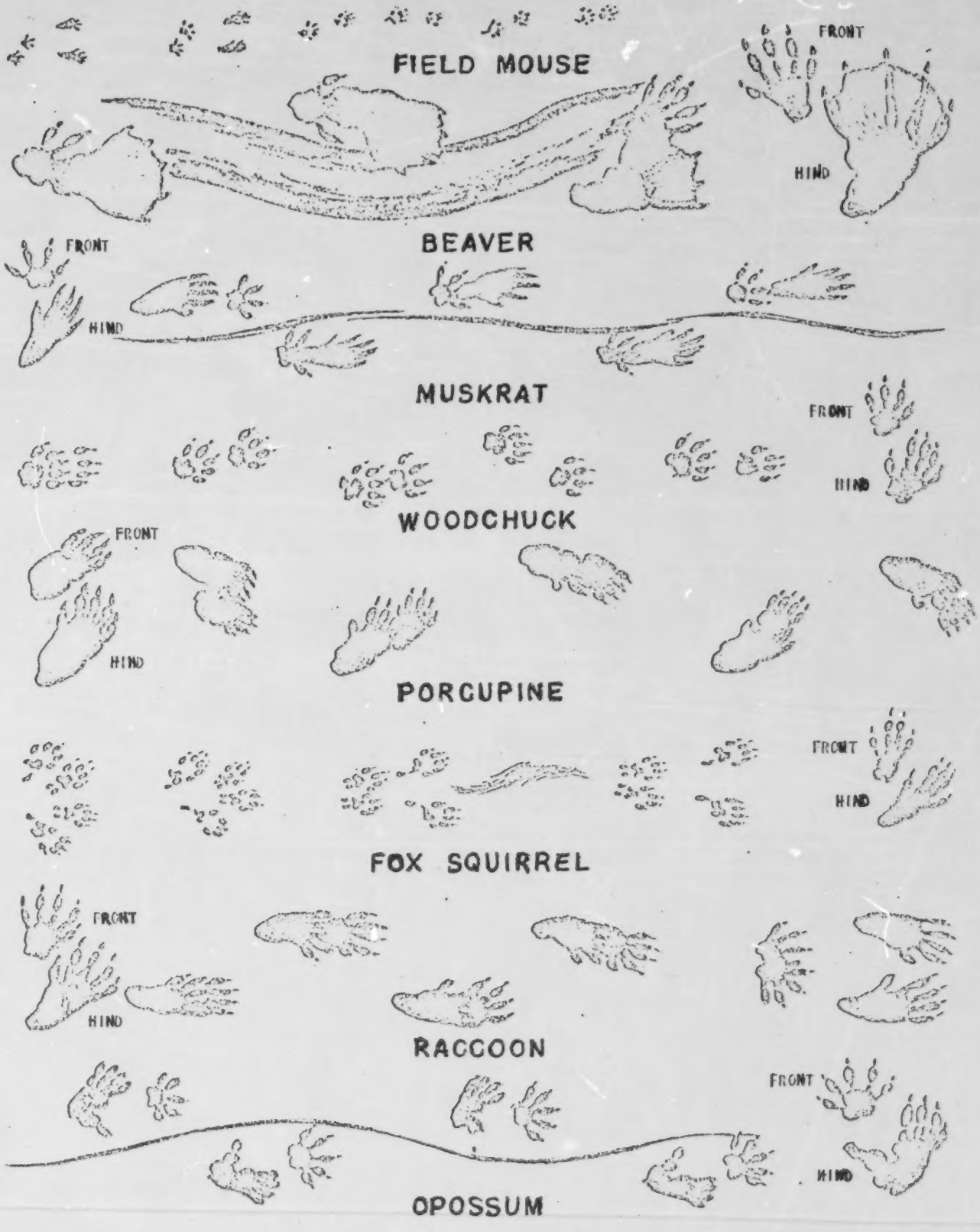
SKUNK

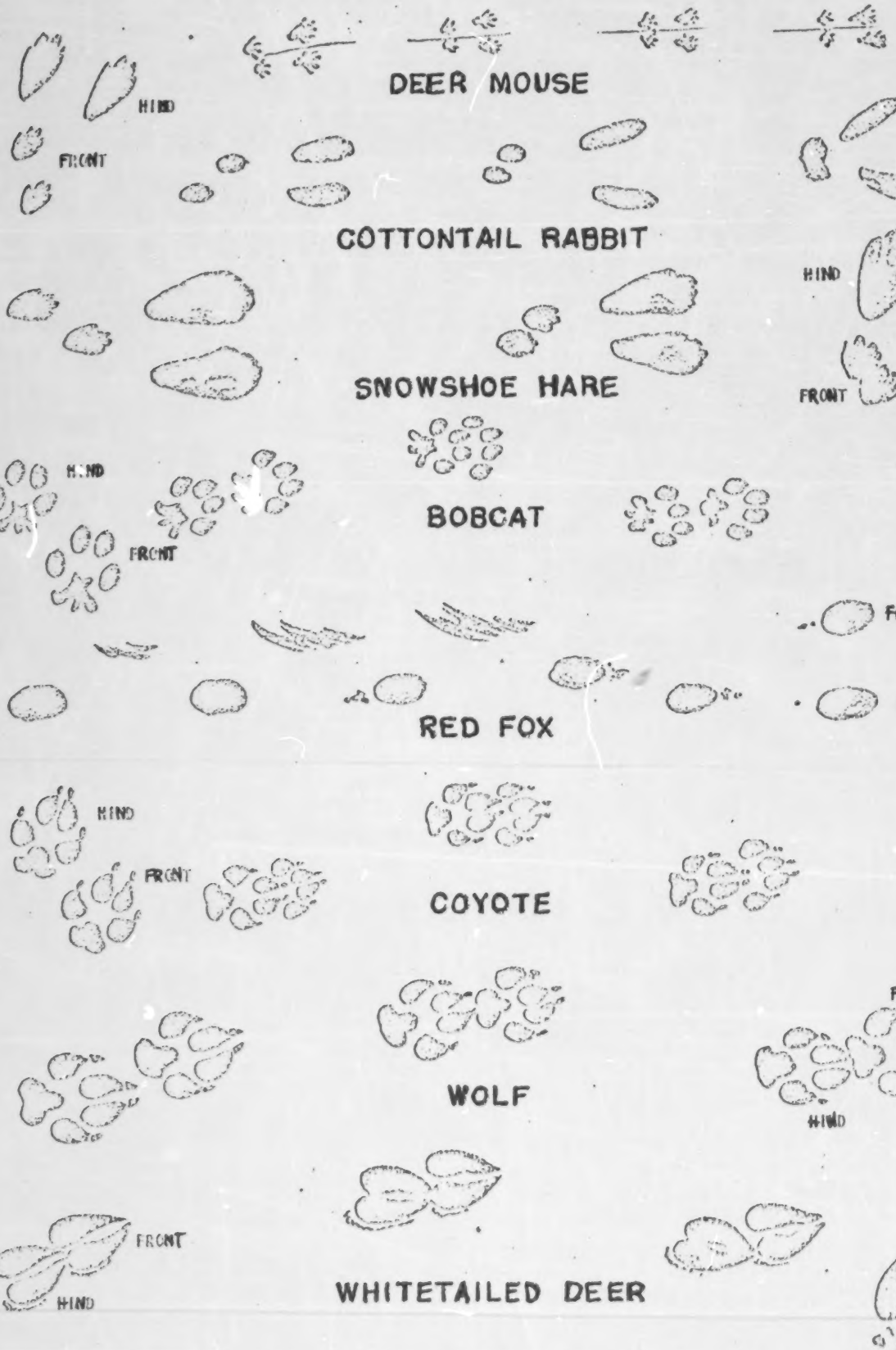


OTTER

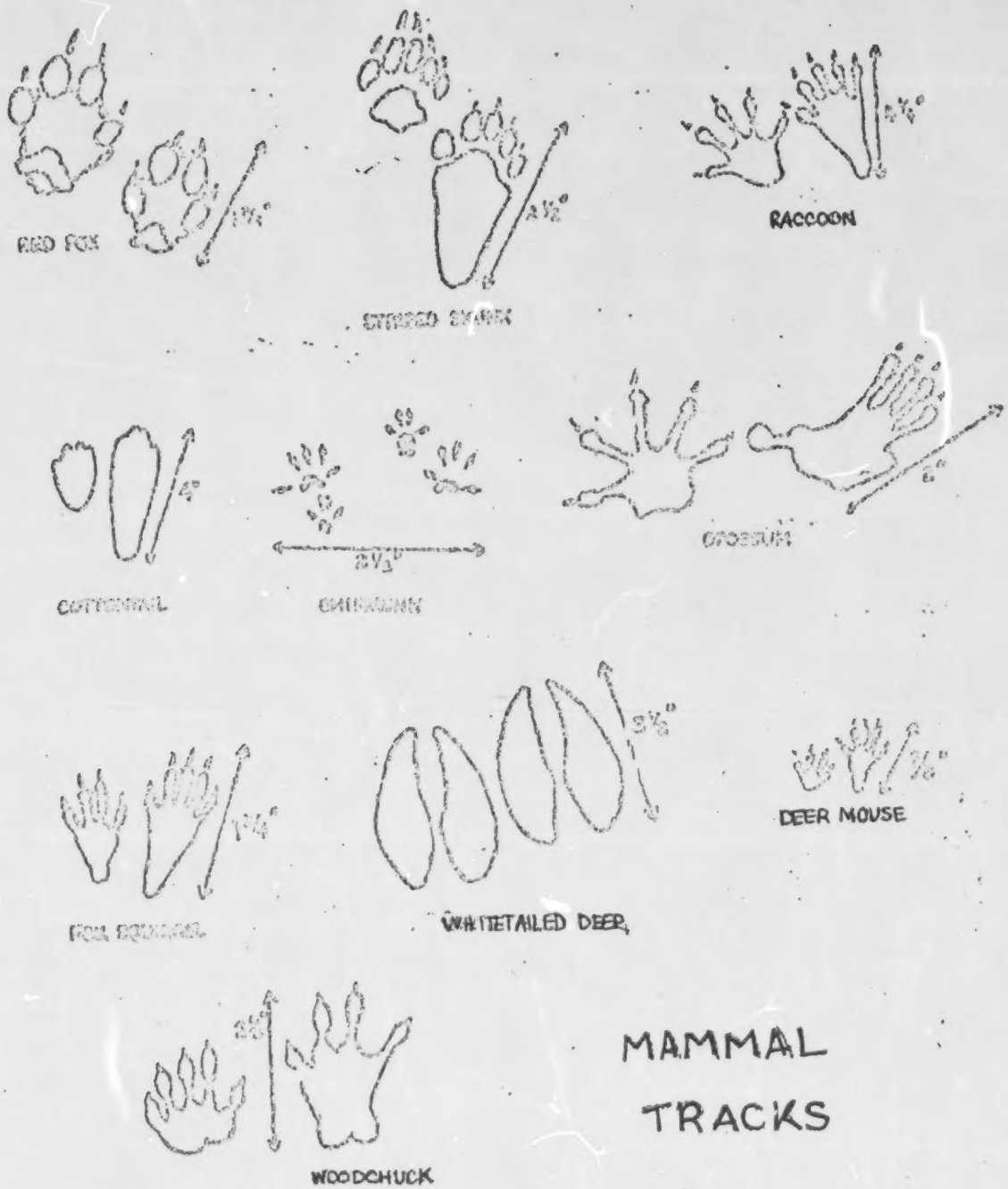
BADGER

BLACK BEAR

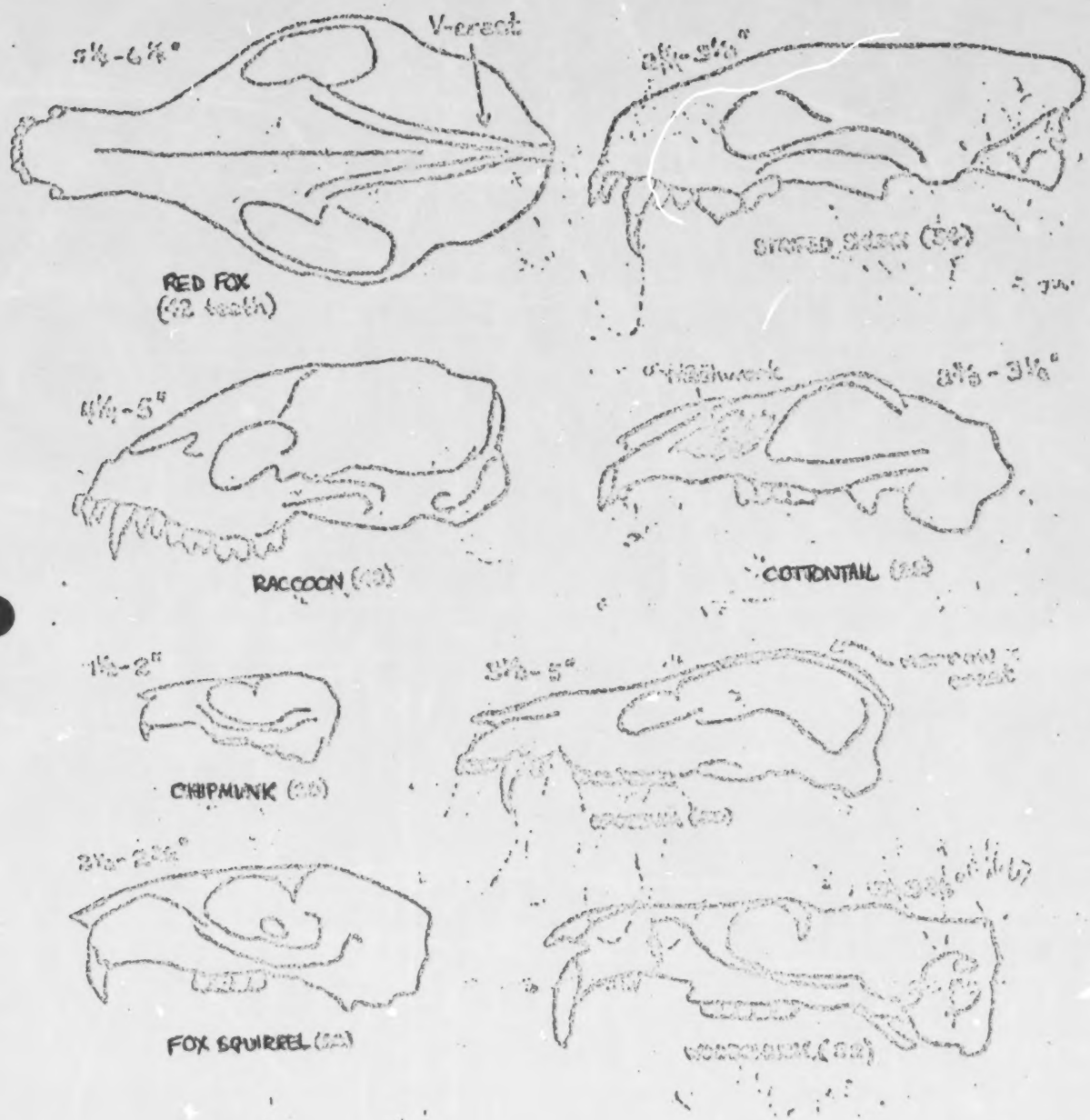

FIELD MOUSE
FRONT
HIND
BEAVER
FRONT
HIND
MUSKRAT
FRONT
HIND
WOODCHUCK
FRONT
HIND
PORCUPINE
FRONT
HIND
FOX SQUIRREL
FRONT
HIND
RACCOON
FRONT
HIND
OPOSSUM



Reprinted from Michigan Wildlife Sketches
GA-211
Distributed by Department of Natural Resources



MAMMAL TRACKS



MAMMAL SKULLS

Length given in inches. Number of teeth in parentheses.

KNOTS

WHIPPING

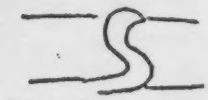


Fig. 1

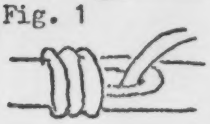


Fig. 2

Rope ends should be whipped to keep them from fraying and unraveling. A lit match held for an instant to the end of a nylon rope will do the job, but a different sort of whipping is required for ordinary rope. A 2-foot length of twine will provide ample for most whipping jobs since, frequently, the whipping is made no wider than the diameter of the rope being whipped.

HOW TO WHIP: Place the string against the rope so that it forms a bight as in Fig. 1 (Abight is formed by turning the rope end so that the end and the standing part--the rest of the rope--lie along side each other.) Then wind the string toward the end, as in Fig. 2, and thread the end of the string up through the bight. The string should be touching but not overlapping on each side as it is wound. When the whipping is complete, pull the end at the left so that the bight is brought under the whipping and the end is brought under with it. Snip off the ends.

OVERHAND KNOT

Some American Indians called this "the knot that ties itself", because they had often seen it formed by nature on plant tendrils. This knot is also the beginning of the square knot among others. Tied to the end of a rope, it well keep the rope from pulling through a hole or the small loop of another knot. It can also be used as a temporary knot to keep the end of a small rope or cord from fraying.

HOW TO TIE: Form a loop by crossing the rope and under the standing part(the rest of the rope) pass the rope end through the loop and pull the rope taunt.

KNOTS FOR JOINING

SQUARE KNOT

Fig. 1

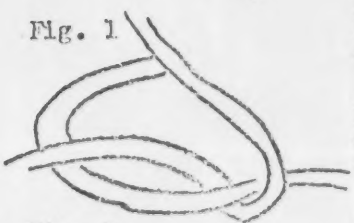


Fig. 2

Fig. 3

Uses of Knot: It is the principal knot used in first aid because it lies flat and is easily untied. It is also for tying two thin ropes of equal size together.

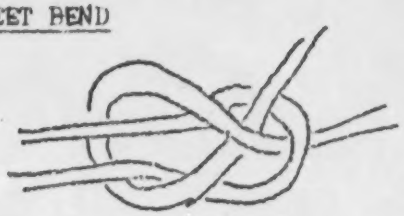
How To Tie: Put two rope ends together, left over right, and twist the lefthand one behind and around in front of the righthand one. Fig. 1

Bring the ends up and even with each other. Now place the end in your right hand over the other and twist it behind and down through the bight. Fig. 2

Grasp both ends with fingers and thumbs and pull ends out to form the knot. Fig. 3

To loosen the square knot, push ends toward each other - or 'upset the knot by pulling back on one end, then pulling the other end through the loop.

SHEET BEND



Uses of Knot: The sheet bend has its greatest value for joining ropes of different thicknesses, but is equally good for joining ropes of the same thickness. It gets its name from its use by sailors to bend (attach) the shee (the ropes used to rig a ship). The Incaz of Peru used the same sheet bend that we tie today, in weaving their fishnets--so did the Stone-Age Lake Dwellers!

How To Tie: Form a bight on the end of the heavier rope and hold this firmly in your left hand. Then pass the end of the thinner rope from below up thru the bight. Bring the end of the thinner rope over, around, and under the bight, then stip it under its own standing part where this enters the bight. Hold the bight with one hand and tighten the sheet bend by pulling in the other rope's standing part.

How To Untie: The sheet bend is easily untied by straightening the bight and pulling the other rope over it.

FISHERMEN'S KNOT

Uses of Knot: The fishermen's knot is used by fishermen to join strands of gut. It is one of the best knots for tieing fish lines together.

How to Tie: Tie an overhand knot in one of the ropes (or lines) but do not pull it taunt. Pass the other rope end through this overhand knot and alongside the first rope's standing part. Tie an overhand knot in the second rope around the standing part of the first. Pull each of the two overhand knots taunt separately. Pull the whole knot taunt by pulling in the two standing parts thereby interlocking the two overhand knots.

How to Untie: To untie the fishermen's knot, pull the two overhand knots away from each other and untie each separately.

KNOTS FOR LOOPS

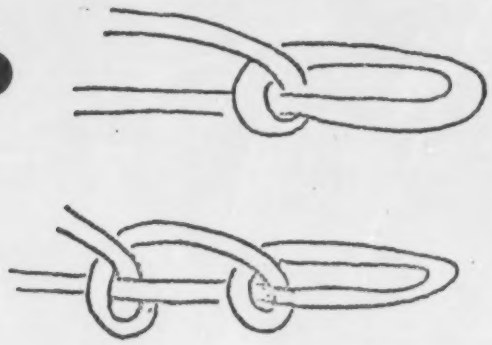
SLIP KNOT

Use of Knot: This is not a very useful knot. But its will hold when a strain is put on it.

How to Tie: Throw the rope in a large loop over the item around which you wich a shipknot to be tied. Tie the end of the rope around the standing part with an overhand knot. (It will be more secure if an overhand knot is first tied in the end of the rope itself.) Pull the overhand knot taunt. Then push it up against the item to be tied and tighten the whole knot by pulling the standing part.

TAUNT LINE HITCH

Knots for Loops, cont.



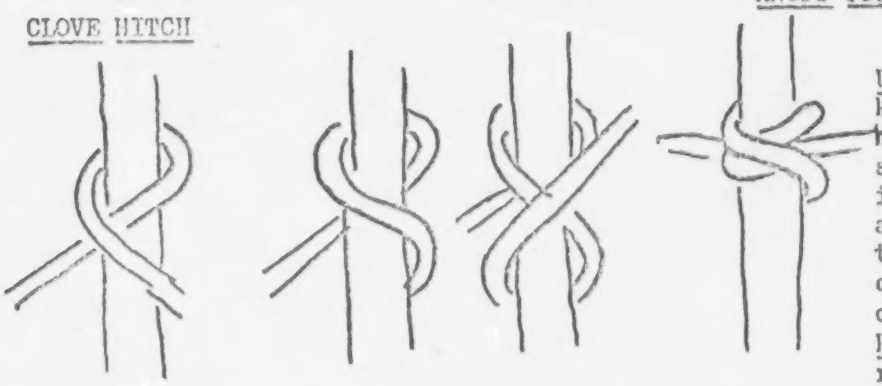
Uses of Knot: The knot can be tied on a line that is taunt. When used for tying a tent guy line, you can tighten or loosen the line by pushing the hitch up or down on the standing part. This hitch will also hold more firmly than the clove hitch on slippery poles.
How to Tie: Pass rope around the peg, then bring the end over and under the standing part and twice (or three times) through the loop formed. Make another turn with the rope and around the standing part by bringing the rope end over, under and through the loop formed. Work the hitch until it is taunt atound the standing part. The hitch can be moved by pushing it up and down the standing part.

BOWLINE (pronounced Bo-lin)

Uses of Knot: The knot is used for hitching, hoisting, ahuling and for mooring boats. The knot is a good rescue knot that you tie around yourself or throw to someone who needs a lifeline. It is entirely dependable and will not slip or jam.
How to Tie: Form a loop by placing the end piece on top of the standing rope. Bring the end up thru the loop from the bottom (be sure to leave as big a loop as you want hanging-not passing that part thru the loop) Bring the end around the standing part and down through the small loop first formed. Tighten the bowline by holding on to the bight formed by the rope end and pulling hard in the standing part.

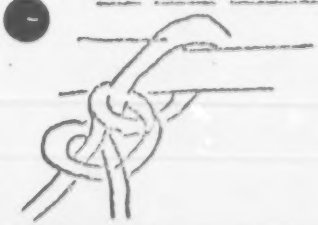
KNOTS FOR ATTACHING

CLOVE HITCH



Uses of Knot: This knot is a snug-holding, near non slipping hitch which is best used around an upright pole or tree trunk. It is often used to begin or end lashings.
How to Tie: Put the rope against the pole and pass the rope around the pole and over the top of the rope placed against the pole (A). Pass the rope around the pole again below the first loop (B) and bring the rope to the front and pass it under the top section of rope (C). Pull taunt (D).

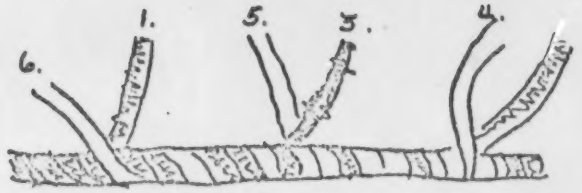
TWO HALF HITCHES :



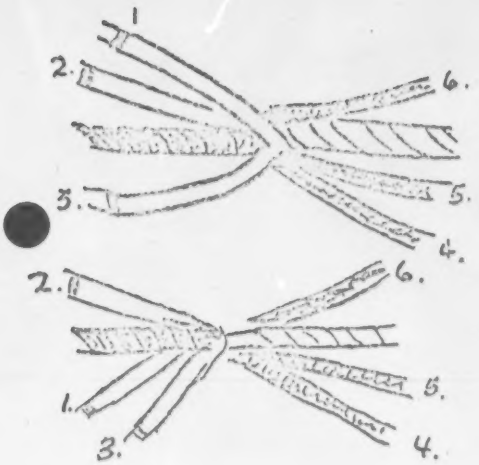
Uses of Knot: This knot is good for fastening a rope to a post ring.
How to Tie: Pass the end of the rope around the pole then over and under its standing part and through the loop formed. Make the second half hitch in front of the first by repeating the process of bringing the rope end over, under and through the loop formed. Push the two half hitches close together and up against the pole. Pull the standing part to tighten everything.

THE LONG SPLICE

The long splice allows a rope to run thru a block and should be used only with two ropes of the same size.



1. Unlay each rope end about 15 turns and place ropes together, alternating strands of each end. (as in A)
2. Unlay strand 4 and fill its place with its partner strand, number 2. Repeat the operation in the opposite direction using partner strands 1 and 6.
3. Tie strands 2 and 4 with an overhand knot then tuck each strand twice. The tuck goes over one strand, under the second and then out between the second and third.
4. Strands 3 and 5 are tied with an overhand knot and tucked.
5. Strands 1 and 6 are halved and partner strands are tied with an overhand knot then tucked.
6. Roll and pound tucks into the rope and clip the strand ends.



THE SHORT SPLICE

The short splice is the strongest way to join two ropes and it involves little waste. It makes a bulkier union than the long splice.

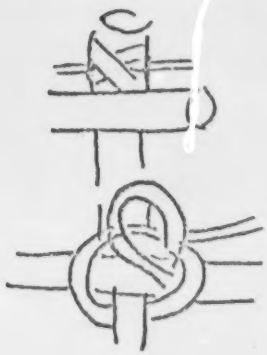
1. Unlay each rope a few turns and alternate the strands. Bring ropes up tight to each other and tie strands down to prevent further unlaying.
2. Tuck strand 1 over strand 4 and under next strand. Repeat operation with strand 2 over strand 5. Repeat operation with strand 1 over strand 3.
3. Remove tie and repeat operations with ends 3, 4, and 5.
4. Make two more tucks for each strand; pound and roll; clip strands.

THE EYE SPLICE

The eye splice is the strongest rope loop.

1. Unlay end of rope a few turns, tie down at end of unlay to prevent further unlaying.
2. Double rope to form loop with unlaid rope pointing across rope. Tuck strand 2 under one main strand of rope. Tuck strand 1 under next main strand. From the back tuck strand 3 under next main strand--making sure the strand end is pointing the same way as the other ends and that it will alternate when next tuck is taken.
3. Tuck each strand one more time. Roll and pound tucks into rope and clip.

LASHING

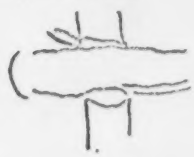


SQUARE LASHING

Place sticks at right angles. Tie a clove hitch to vertical stick slipping knot around so that the long end or rope pulls directly out from the knot.

Bind sticks together by passing twine (rope) down in front of horizontal stick, under and out to back, around upright stick and back to front of horizontal stick, then up in front of horizontal stick, in back of upright and out to front again. Repeat this several times being sure to pull it tight and lay each round of cord neatly beside the previous round.

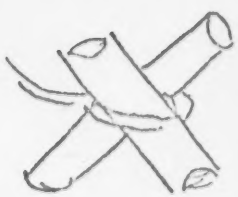
front view



back view

FRAPPING

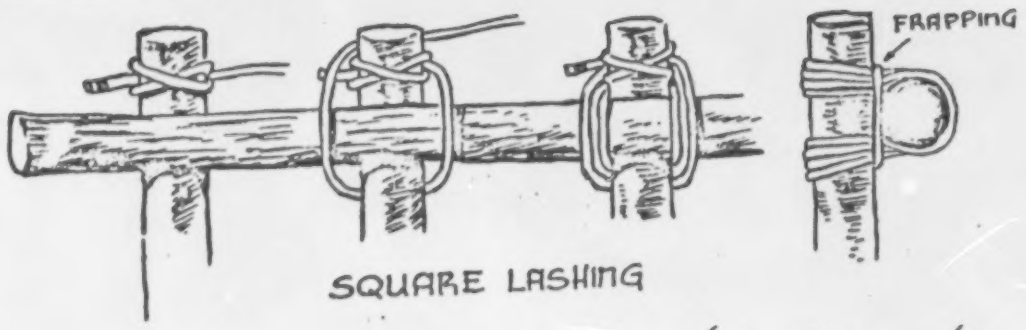
Tighten the binding with a frapping. Do this by winding the twine between the two sticks pulling the first binding tight. End by making two half hitches around one stick or by joining the binding twine to the starting end. Tuck the ends in under the lashing.



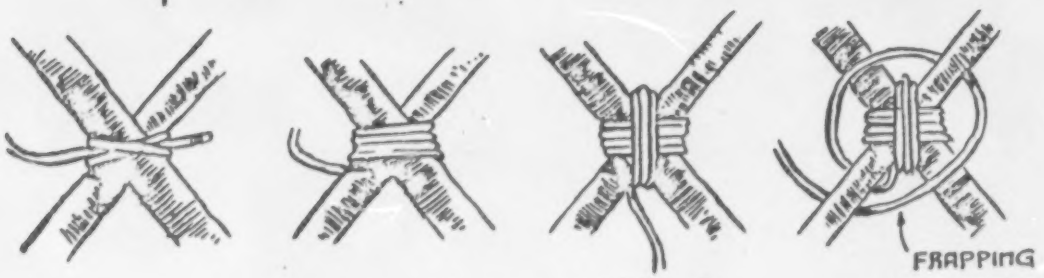
DIAGONAL LASHING

Place sticks in an X fashion, make a clove hitch around the two sticks. Make 3 or 4 turns around one fork.
Then make 3 Or 4 turns around the other fork being sure to pull tightly.
Frap and end the lashing as you did in a square lashing.

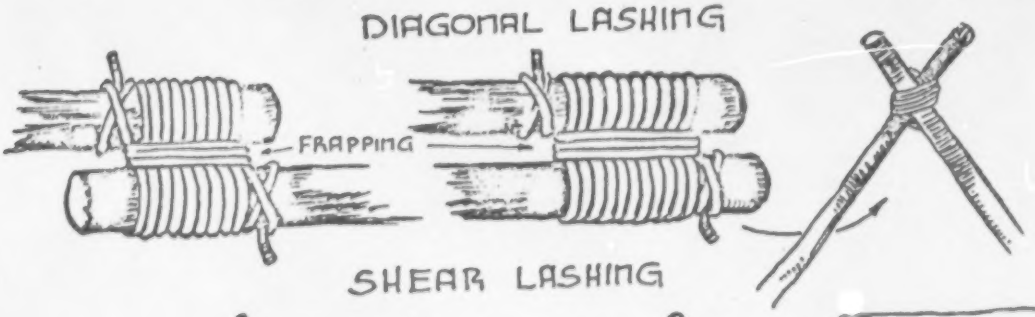
CAMP LASHINGS



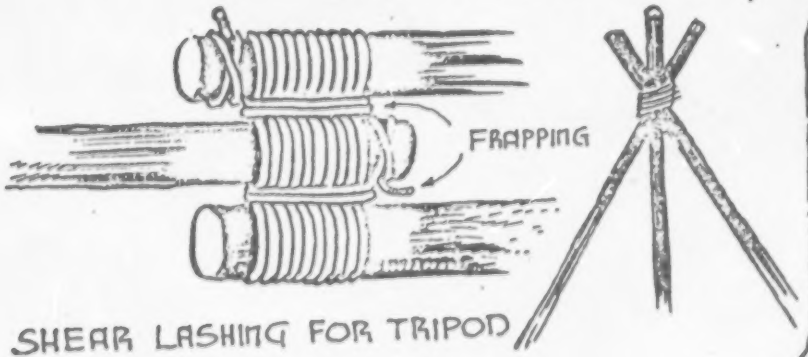
SQUARE LASHING



DIAGONAL LASHING



SHEAR LASHING



SHEAR LASHING FOR TRIPOD

EMERGENCY FIRE BUILDING
(without matches)

Equipment:

a piece of flint or chert stone
steel (an old, small file)
00 or ooo steel wool
several flashlight batteries
birch bark if available
cedar bark or similar material
charred cloth if available
an Indian fire bow
a magnifying glass
a steel match
a pocketknife or a small piece of steel

Procedure:

From the time that the caveman first discovered fire, it has been one of the prime ingredients of man's life. Most outdoorsmen agreed that fire is very important to survival in the wilderness. In this modern day, emergencies come unannounced. One moment we could be well-dressed in a plane and the next a crash victim. Our survival might very well depend on our ability to produce a fire for warmth, security, drying clothes, signalling or cooking.

In the event of a disaster, many things could be found at the scene to aid in fire building. For example, metal, charred cloth, tinder, fuel, batteries, etc. could be used in a number of ways.

TINDER:

Probable the most important ingredient in fire starting is good dry materials. Without carefully prepared dry tinder firemaking is nearly impossible. Tinder is best made from the inner bark of dead cedars or related trees. Take the fine fibers of the inner bark and break into small string like sections. Roll these between your palms until you have a very fine cottony nest. Speaking of nests, the lining of some birds nests makes fine tinder. Small twigs are added to the fire next getting gradually larger. It is imperative to have your tinder, kindling and wood carefully arranged before you attempt to make a fire. TINDER PREPARATION AND CAREFUL LAYING OF THE FIRE IS OF THE UTMOST IMPORTANCE.

BATTERIES:

From a car, plane, snowmobile or flashlight batteries can be arced to produce fire. Arc them into tinder or charred cloth to hold the spark. Take a small piece of 00 or 000 steel wool, thin into small strand. Touch to both ends of a single flashlight battery and it will produce a spark which can be fanned into a flame with tinder.

FLINT AND STEEL:

If you don't have a flint and striker, take a piece of metal from the wreckage or wherever possible. Use this for a striker and begin to pick up stones and strike them a glancing blow until you find one which produces sparks well. Possibly take some charred cotton cloth from a wreck. Use it to catch and retain a spark, place in tinder and gently blow into until you produce a small flame. Use a flint rock, an old file, some charred cotton cloth and tinder and show the students this is possible.

A STEEL MATCH:

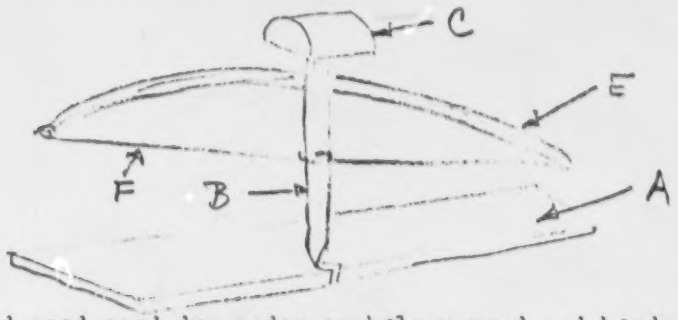
A steel match is a commercial spark producing material which can be scraped or struck with a knife to produce fire. These inexpensive tools can be carried on you when you go into the wilderness.

A MAGNIFYING GLASS:

A magnifying glass is a useful tool for the woodsman. It allows closer examination of many of the minute organisms in nature. It will also produce a fire very quickly with dry tinder, (on a sunny day of course). This is a severe limitation, but it could be used to extend the supply of other fire producing material.

INDIAN FIRE BOW OR DRILL:

The Indian fire bow or drill is probably the least desirable method of making a fire, but it can be done with a great deal of energy, patience, and perserverance. But first you would have to make one.



You would need good dry cedar or balsam wood and hardwood such as hedge (osage orange). First of all split the cedar (white or red) into about ½ inch thick planks. Cut about 1/8 inch wide notch about 3/4 inch in from the edge. Set aside.
Whittle a five or six sided drill (B) about 13" to 18" long, point on both ends. Make it out of the same wood as the base. Set aside. Make a drill holder (C) out of hardwood or stone. Make an indentation in it so it will hold the drill when you spin it.
Also needed is a box (E) which can be made of some green, limber wood about 1" in diameter and 2-2½ feet long. It is just like a shooting bow except that the thong (F) or bowstring is wrapped around the drill once or twice for tension. For string a leather shoe lace could be used or cut a narrow strip from your belt.

Now that you have the equipment, put it together like the diagram and start a hole at the end of the slot. Put some very fine tinder under the slot to capture the ember which you will create by friction. Hold the board firm with one foot while slowly rotating the drill with the bow. After great effort you will notice a faint wisp of smoke arising from the hole you are drilling. Continue the firm motion until you have considerable smoke. Stop motion and with the tip of your knife put the ember you created by friction in some more tinder and fan it gently to a flame. CONGRATULATE YOURSELF - YOU DESERVE IT.

The important thing about all of the above methods is that you allow the student plenty of time to practice themselves. They really enjoy it and have a great feeling for the determination and effort required.

SURVIVAL

Ma teriels:
1. 4 by 8 sheet of plastic
2. survival kit made from band-aid box including:
   a. length of wire (guitar string)
   b. fish hook
   c. small water-proof container with matches, boullion cubes, sugar cubes
   d. small mirror
   e. razor blades
   f. tape
   g. mono filament
   h. small sheet of plastic
   i. whistle

Proceedure:

T his lesson will involve a hike with periodic stops to discuss and give examples of survival. A good place to begin the lesson is on the hill to the north of the dining hall. This is a convenient place to stop the group and open the survival kit and discuss the value and need for each item in the kit. continue with a walk through the hills and timber to the north discussing the following concepts:

1. construction and use of a water still
2. being on the look-out for evidence of civilization (litter, trees cut by man, fallen fence, etc.)
3. The importance of an occassional yell--especially upon finding items mentioned in number 2.
4. When walking in a group count off by number and do soevery half hour or so to insure against lost group members.
5. When you come to a stream or any estuary discuss methods of determining direction of flow. Discuss the fact tha t most running water will eventually lead to civilization.

SURVIVAL

As the results of an unfortunate happenstance you and your companions are now alone and lost in the forest.

You are only able to salvage a Silva Compass, a piece of cloth (possibly the shirt off your back) a shovel (it should fit your hand), a bucket (with hole only in top), a first aid kit (containing three bandades, Halazone Tablets, bottle of iodine, roll of tape and a knife) and your wristwatch. With these items, the forest and your wits you must survive.

STATION 1 -
Food - Here are some hints on how to prepare wild plants
The White Oak Acorn is theonly sweet acorn. All others must be leached for two hours with several changes of boiling water. Acorn Meal Dry the shelled acorn meats in a slow oven or in the sun. Grind with a fine plate of a regular food chopper. They may have to be run through the chopper several times. Store in clean covered glass jars. Use for bread or griddle cakes.
Dandelion is gathered when the dandelion crowns which is when the crown is almost flat on the ground ineearly spring. Keep in ice salt water and fix like greens. These crowns make good cooked greens by cooking in two or three batches of salt water. Cook approximately 5 minutes in each bath. Then season with salt, butter or salad dressing. Serve hot like spinach. Dandelion Coffee - can be made all year. Dig roots. Split and roast in a slow oven until crisp and brown. Grind in coffee mill or coarse food chopper. Store in covered jar. Cook like doffee, but use only $\frac{1}{4}$ as much.
Wild Mustard take young plant leaves and buds. Cook for 30 minutes.
Wild Onion is gathered when the onions have not flowered. Remove the tough outer skin. Cook in water. Boil for approximately $\frac{1}{2}$ hour. Drain. Season and serve hot. Save the water the onions were cooked in and use it for making onion soup.

STATION 2 -
Shelter - find a tree that has been blown over in a storm. The log could serve as a ridgepole for a primitive shelter by stacking fallen branches and other plants against it.

STATION 3 -
Water - Since water is a very urgent requirement you will attempt to make the water in a stream drinkable. How:

You must use the materials available to you. Think about it..Try filtering it...then write how you would purify it for drinking.

To filter muddy water you can strain it through a cloth. (One was provided for you, so I hope you didn't get your shirt wet!)

Three methods of purifying water in the wild are using Halazone tablets, or adding iodine (from your first aid kit) until you smell chlorine and you can boil water for five minutes and aerate it by transfering it from one container to another.

STATION 4 -

It has been some time since you crashed and are now getting hungry. As this station there are two edibles. Identify them and tell how you would prepare them for eating.

There are many, many plants from the wild that are both nourishing and palatable (believe it or not!) A more complete reference FREE FOR THE EATING by Bradford Angier is a good source.

Find a station that might have these plants close by.

Milkweed. Shoots, leaves, pods and flowers are all fixed the same way. Cover with boiling water. Boil hard for one minute. Drain and repeat three or four times. Then boil for ten minutes. Season and serve. Do not put in cold water and boil. This will set the bitter taste.

Pig weed. Cook young leaves as you would spinach. Serve with vinegar, salda dressing or butter. Gather seeds in the fall. Grind fine and mix half and half with wheat flour. Makes fine pancakes, muffins and biscuits.

Purslane. Take young tip leaves. Wash well and boild for 10 minutes. Drain and season with butter and salt.

STATION 5 -

Shelter - Although it may be advisavle to construct a shelter when you have lost your way in the woods, might may come upon you suddenly, and you will not have time to do so. In this general area there is a bank. Will it serve well as a shelter. with a little work from you.

The creek bank can be used as a temporary shelter with little excavation. The bank will also reflect the light and heat of your fire. CAUTION: Beware of flash floods during heavy rains here or upstream.

SHELTER 6 -
Water Supply - It is time to re-establish your water supply or death is on its way.

Dig a hole in the looser sands of a damp area. If the hole is deep enough and the ground damp enough, seepage will provide you with water. Do not waste your time digging in unlikely areas. Damp areas at the base of hills or dry creek beds are best. Don't forget to bury your hole.

STATION 7-
In some instances it is best to know your position relative to north. On sunny days it is possible to find north by using your watch. To do this you must point the hour hand at the sun. A north-south line is then midway between the hour hand and the numeral 12. Before noon the sun is in the east. After noon it is in the west.
How could you determine north with your watch on a cloudy day/

On a cloudy day a stick may be placed at the center of the watch. Hold it so the shadow of the stick falls along the hour hand. Half the distance between the shadow and 12 o'clock is north.

STATION 8 -
At this stations is a creek bed. At times it is necessary to follow a creek, river, etc. to its outlet which will be a larger body of water and perhaps signs of civilization. You have one problem though. Your creek is dry. How can you tell which direction the water would flow? Write you answer.

If you noticed the tall grass near the bank was beaten down by the water in the direction of the flow. The gradient of the creek bed is also a way to determine the flow, but not always as obvious.

STATION 9 -
It is time to find north again only this time the trees will give us the answer. Please note the moss growing on the trees. Is it possible to find north by examining these trees?

Although the assumption that moss only grows on the north side of trees is false. It is true that moss will grow mainly in places that are shady. Trees that are exposed to sunlight along their trunks will have "more" moss than on the south side of the trunk which is exposed to the sun. By examining a large number of trees it is possible to determine the direction of north as opposite of south.

STATION 10 -
A fire is needed to help you in preparing food, keeping warm and warding off tigers. The three necessary elements to create a fire are heat, combustible materials and oxygen. Since oxygen is available, provide the heat and combustible materials and build a fire. As you are now seated by the warm glow of the friendly flames you may find suggestions on how to start a fire.

A fire could be started through the friction of rubbing two dead dry sticks together.

A fire could be started by making a bow with a bent stick and string (vine). Twist the string and insert a second stick placed upon a wooden block. By pushing the bow back and forth the stick twisted in the string creates a fire through friction with the base block.

A spark created by hitting a flint stone on your knife may also start a fire.

However, we recommend using the magnifying glass on your compass. Focus the sunlight through the glass on as small a spot as possible. Flames should erupt (in time). Any one of these methods will work more quickly if you attempt to light tinder first. Tinder maybe birch peelings or dried grass or leaves.

If you have been able to find food fire, water and shelter of at least one type - there is a chance of your survival. If not - it has been . . . . .

CAMPFIRE

Fire Building: To build a fire you need a safe fire area. You'll need tinder to catch the match flame. There must be body kindling to catch the flame from the tinder. When that's going, use bigger pieces to give constant heat.
Tinder - Tinder is stuff that flares up when you touch it with a lighted match. Paper is tinder. But you'll want to use dry bark, dead weed tops, twigs, or make shavings from split dry wood.
Kindling - This is the next size of wood. Small dead branches still on the tree make good kindling. It's called "Squaw Wood," because Indian women collected it for their fires. Take only wood that snaps easily when you bend it.
Fuel - Use deadwood. Use wood of about lo to 12 inch lengths.
Fire Area - Find an open space that is about 10 feet from the nearest brush or tree. There should be no branches above the fire area. Clear a 10 foot circle of dry leaves, grass, twigs, pine needles, etc. Make sure the fire area is free of debre.

Campfire: Ingenuity, imagination, pluse a little extra planning are all that is needed to make your campfire sparkle. The satisfaction that you'll see in the faces of the children will make the task worthwhile. The informality and spontaneity of the campfire make up its principal charm, so a brief outline will probably be enough. You don't have to come up with a fancy production. If the ingredients are properly mixed and well served, everybody will enjoy themselves.

A Typical Campfire Program; Before we discuss each of the individual ingredients of a campfire, let's take a look at the whole pattern - a sort of bird's-eye view of the whole show.
..Opening ceremonies - colorful, related to lighting the fire.
..Songs and icebreakers - fold songs, fun songs, rounds, action songs, gimmicks, and other icebreakers.
..Dramatics - stunts or skits.
..Stories - mysteries, tall takes, adventure, biography, and true stories.
..Announcements - brief
..Closing ceremonies - quiet campfire ending or leader telling a simple quiet poem.

Every campfire will have a combination of four or five of these campfire ingredients. Campfires might have all of them, but this could make a campfire program too long. Develop your program around the ingredients that will do the things you want to accomplish.

Rules for the Campfire: It is easier to prepare a set of fules than it is to carry them out. The good campfire will have these as a matter of course:

..Secure attention: don't talk until you have it.
..Get the program under way on time and fast. This is the time for fire-lighting ceremonies, lively songs. Introductions of new members can be made.
.."Follow the fire" - loud and lively material as the fire burns brightly, then more quiet items, ending on an inspiration note. This is a good general rule, but it is subject to variation.
..Have as few rules as possible and enfore them.
..Avoid all "stage waits," keep things moving, if someone delays, pass along quickly to the next number.
..Variety is a virtue. After a quiet story, put on a lively song.
..Do no permit cheap and vulgar songs, sketches, or stories. It takes courage to nip these in the bud.
..Maintain leadership. Never let students interrupt and tell you how to run the show.
..Close on time. With a good sense of timing, you can hurry or slow up to finish on time.

To summarize: You as the leader should have good fun, good taste, and translate ideals into action.

Campfire - Songs and Skits

Rules

1. Relax - you don't have to be a singer or the director to lead campfire songs. A simple easy, up and down beat is enough.
2. Explain clearly just what they are going to sing and make sure they know the words.
3. Give them the proper key by humming it. Make sure the pitch is right for the group. Start all together with a downbeat.
4. Preserve your sense of humor. You are dealing with children, so don't expect perfection.
5. As a general proposition, all songs that are not too long should be sung twice...once for practice and once for a more perfect rendition.
6. Explain that many songs shouldn't be sung loudly. After you get the group really singing, try one verse very softly, then a little louder for barbersop harmony.
7. Action songs are generally hit numbers - but we sure you know them well. This also applies to rounds.
8. Never ask, "What shall we sing next?" You will get as many different replies as there are children. Have your songs in mind beforehand and hold a few in reserve. This will tend to sidetrack numbers with somewhat doubtful lyrics that children, knowing no better, may suggest.
9. Above all, make sure your opening song is a natural hit number, known and loved by all, and that your finale has a patriotic or inspirational flavor. Hymns are excellent, but remember the rule of "time and place" and make sure that none of the words offends those of varied faiths in the group.

SKIT IDEAS

LION HUNT
Take a seated position in front of audience so all can see you. Narrate the following:

Would you like to go on a lion hunt? OK, let's go. Watch me and do all the things I do. Here we go!

Way, way down in the keep dark jungles of Africa, there lives a tribe of Pygmies.

One morning the chief gets up, yawns, stretches, and looks at the sky. (Go through the motions). He calls all the Pygmy braves from their huts. (Sound one "Whoop!" cupping your hands over your mouth.)

The braves all come out, stretch, and answer their chief with two whoops. (Give two "Whoops!") The warriors go to the chief's hut to talk over their plans. (Have all repeat: "Soda water bottle soda water bottle.")

The Pygmies say good-by to their wives. (Make low sound, "Wo-wo wo-wo," cupping your hands over your mouth.) Here we go down the trail. (Produce sound of marching Pygmies by slapping your knees, alternating hands.)

We're going out in the tall grass now. (Rub your palms of your hands back and forth) Up ahead there's a big river with a bridge. Here we go across the bridge. (Hit your chest with your fists alternating) We're across. (Resume marching tempo)

We're starting up a mountain. (Slower tempo) This is hard work (Slower and slower) We're getting close to the top now. (Tempo quite slow, then back to normal) We're on top now; here we go down the other side. (Speed marching to a fast tempo, then back to normal) OK, We're back on level ground. Oh, oh Narrow creek. No bridge. Better jump. Run! (slap knees fast, long pause, then one loud slap) Made it! More tall grass. (rub palms together) Sh-h! (Have all repeat Sh-h!) Sure looks like lion country. Yep, there's a lion ahead. We have to sneak up on him. (walk fingers of right hand across palm of left hand) Suddenly the lion charges with a roar. (ROAR!) The Pygmies turn and run. (Fast tempo against your knees. Now repeat all the actions and gestures in reverse): We're back to the grass... jump the creek...climb the mountain...cross the bridge...run through the grass...big sigh of relief. And then wives start asking questions all at once. You know how women talk. (say, Rhubarb, rhubarb")
OK we've been on a Pygmy lion hunt and we have been lying all the time.

SKIT IDEAS

Divide the audience into eight groups. Assign a character role to each. Have them rehearse their parts once. As each character is mentioned, the group stands up, shouts the proper reponse and sits down. Read the story.

CHIEF....."Me empty"
BRAVE....."Ki-yi"
PONY....."Clip-clop, clip-clop "
BOW AND ARROW....."Swiiisssssshh"
FIRE....."Crackle, crackle "
TOM-TOM....."Boom, boom "
NORTH WIND....."Whooo, whoooo"
DEER....."Scitter,scatter"

Many moons ago in the land of the Plains Indians - the tribes of the Pawnee, Arapaho, Cheyenne, and Kiowa - there was a village that was in trouble. For many days no rain had fallen and the crops were drying up. The buffalo and the DEER had gone north to seek better water holes. Their very existence depended on the securing of fresh meat.

The CHIEF called a conference of all the male members of the village. They all gathered around the FIRE as the TOM-TOM sounded the call. When all were present, the CHIEF looked around the circle. It was complete, even to his own son, a BRAVE of just ninetween harvests. They discussed their problem until the FIRE dwindled to smoky red ashes. Finally the BRAVE stood up and said that the only way was for a true-blooded member to go far off where the DEER were grazing and return with food for the village. He himself would go.

Early the next morning the BRAVE mounted his PONY. As the TOM-TOM sounded, the BRAVE waved to his father, the CHIEF, and rode off on his PONY into the NORTH WIND.

Onward the trail led with the BRAVE and the PONY getting weak. The NORTH WIND howled with glee. Finally, he came upon a small water hole. There drinking, were two find DEER. The BRAVE tethered his PONY, aimed his BOW AND ARROW, and let fly two direct hits.

the BRAVE started back to the village with the two DEER strapped to the PONY'S back. Southward they trod and the going was slowere and slower. Despite his great hunger, the BRAVE ate very sparingly, for he knew his people were depending on him. Finally, he came upon a scout from the village. The Indian sounded his TOM-TOM, signaling the CHIEF and his people. This story of his PONY and hisBOW AND ARROW is relived today in Indian dance legend to the sound of the TOM-TOM.

SKIT

Let's Take a Trip
The leader stands before the group and says, "want to take a trip? Just say what I saw and do what I do - that's all there is to it. All set? Let's go!" "I think I'll take a trip (children repeat this and the following phrases.)

Let's pack (makes motions of putting things in pack, then throws pack over shoulders. Audience imitates action.)

Out through the door! (Single loud clap to indicate the banging of door.)

Down the street! (slow marching claps with both hands against thighs.)

Awfully big town! (continue marching)

Out in the country at last! (Speed up marching.)

Here's a river (Continue marching.)

And there's the bridge. (Hammering fists against chest in march tempo, then continue with flat hands against thighs)

Heres a field (Resume ordinary marching)

Let's cut across (Swish palms against each other)

Oats (Continue swishing)

Nope wheat! (Continue swishing, then switch back to hands on thighs)

Here's another river. (Stop clapping)

No bridge! We'll have to jump! (Fast clapping on thighs, then both arms up in the air and down again to indicate big jump. Resume clapping. Slow down. Stop. Start again, hesitatingly. Stop. Agains slow start. Stop. Right hand to forehead, look in several directions.

Lost! (Seceral slow clapping starts and stops.)

There's a tree! (Fast clapping to indicate running to tree, then arm action to show climbing. Right hand to forehead, look in several directions.)

Still lost! (Slow climb down, several hesitant clapping starts and stops.)

There's a cave. (Fast clapping to indicate run to cave.)

This side is cold. (Feel with right hand against imaginary side.)

There's a light. (Point with one finger)

There's another lihgt. (Point with two fingers)

They're eyes!

It's a bear! (Quick action, reversing presvious order. Run, climb up and down tree, jump river, swish through field, run over bridge and along strees, and wind up with a strong clap for banging of door.)

HOME!.....HOORAY!

SKIT IDEA

GATHERING OF THE NUTS
Select a cast to enact the following dramatic roles and read the play allowing time for each character to play his part?

Horns....."Toot, toot"

Drum....."Boom, boom,boom"

Cymbals....."Clang, clang"

Curtains.....(two people stand together) then part

Moon.....(Get up)

Trees.....(wave arms)

Sun.....(sit down)

Wolf.....(Howl at moon)

The ORCHESTRA plays and the CURTAINS part. The TREES wave in the breeze. The SUN sets. the MOON rises. And a WOLF enters howling. Did you ever see such a gathering of nuts?

CAMPFIRE SONGS - Rounds

HI HO! NOBODY HOME
Hi, ho nobody home
Meat nor drink nor money
have I done
Yet will I be merry.

THREE BLIND MICE
Three blind me, three blind mice
See how they run, see how they run
They all ran after the farmer's wife
She cut off their tails with a
carving knife
Did you ever see such a sight in
your life
As three blind mice.

ROW, ROW, ROW
Row, row, row your boat
Gently down the stream
Merrily, merrily, merrily,
merrily
Life is but a dream

ONE BOTTLE OF POP
One bottle of pop
Two bottles of pop
Three bottles of pop
Four bottles of pop
Five bottles of pop
Six bottles of pop
Seven bottles of pop

Fish and chips and vinegar
Fish and chips and vinegar
Pepper, pepper, pepper pot

Don't put your trash in my
backyard, my backyard
my backyard.
Don't put your trash in my
backyard
My backyard's full.

AMERICA
Ammerica, America, America
Let me tell you how I feel
You have given me your riches
And I Love you so.

A WUNI
A wuni cuni cha a wumi
A wuni cuni cha a wuni
Ei yi yi yippee chi yeana
Ei yi yi yippee yi chi yeana
woo a wuni keechi

WASAW
Wasaw the forty-second
Wasaw they gwana war
Wasaw the forty-second
Marching through the brenbles raw

Zoom de them wore boots and stockings
Zoom de wore none at all
Zoon de wore boots and stockings
Marching through the brambles raw

ZOOM, ZOON, ZOOM, ZOON.

CAMPFIRE SONGS - Action

IF YOU'RE HAPPY

If you're happy and you know it
clap your hands
If you're happy and you know it
clap you hands
If you're happy and you know it
your life will surely show it
If you're happy and you know it
clap your hands.

If you're happy and you know it
stomp your feet
If you're happy and you know it
stomp your feet
If you're happy and you know it
your life will surely show it
If you're happy and you know it
stomp your feet.

If you're happy and you know it
shout HOORAY
If you're happy and you know it
shout HOORAY
If you're happy and you know it
your life will surely show it
If you're happy and you know it
shourt HOORAY.

If you're happy and you know it
do all three
If you're happy and you know it
do all three
If you're happy and you know it
your life will surely show it
If you're happy and you know it
do all three.

TH FF JOLLY FISHERMAN

There were three jolly fisherman
There were three jolly fisherman
Fisher, fisher, men, men, men
Fisher, fisher, men, men, men
There were threejjolly fisherman

The first one's name was Abraham
The first one's name was Abraham
Abra, Abra, ham, ham, ham, etc.

The second one's name was I-I-saac,
The second one's name was I-I-saac,
I-I, I-I, zik, zik, zik, etc.

The third one's name was Ja-a-cob
The third one's name was Ja-a-cob
Ja-a, Ja-a, cub, cub, cub, etc.

They all went up to Jericho
They all went up to Jericho
Jer-i, Jer-i, cho, cho, cho, etc.

They should have gone to Amsterdam
They should have gone to Amsterdam
Amster, Amster, sh, sh, she etc.

I shouldn't say that naughty word
I shouldn't say that naughty word
Naughty, naughty, word, word, word, etc

I'm gonna say it anyway
I'm gonna say it anyway
Any, any, way, way, way, etc.

They should have gone to Amsterdam
They should have gone to Amsterdam
Amster, Amster, dam, dam, dam, etc.

SOCKS

Oh **********don't wear no socks
I saw her when she took them
off - A ding dong
I saw her throw them on the chair
Now that chair is growing hair
A Ding dong, dong, dong, a ding dong
She throw them in the air, a
ding dong
Now the birds don't fly v. far
A ding dong, dong, dong, a ding dong
She throw them in the sky
Now Superman refuses to fly
She throw them in the boat
Now the boat doesn't float

She throw them on the wire
Now that's what started the
Chicago fire.

CAMPFIRE SONGS - Quiet

KUM BA YAH
Kum Ba Yah, my Lord, Kum ba yah!
Kum ba yah, my Lord, Kum ba yah!
Kum ba yah, my Lord, Kum ba yah!
O Lord, Kum ba yah.

Someone's crying Lord, Kum ba yah!
Someone's crying Lord, Kum ba yah!
Someone's crying Lord, Kum ba yah!
O Lord, Kum ba yah.

Someone's praying Lord, Kum ba yah!
Someone's praying Lord, Kum ba yah!
Someone's praying Lord, Kum ba yah!
O Lord, Kum bayyah.

Someone's singing Lord, Kum ba yah!
Someone's singing Lord, Kum ba yah!
Someone's singing Lord, Kum ba yah!
O Lord, Kum ba yah.

Come by here my Lord, Come by here!
Come by here my Lord, Come by here!
Come by here my Lord, Come by here!
O Lord, Come by here.

HE'S GOT THE WHOLE WORLD IN HIS HANDS
He's got the whole world in His hands,
He's got the big, roun' world in His hands,
He's got the wide world in His hands,
He's got the whole world in His hands.

He's got the wind and the rain in His hands,
He's got the sun and the moon in His hands,
He's got the wind and the rain in His hands,
He's got the whole world in His hands.

He's got the little bitty baby in His hands,
He's got the little bitty baby in His hands,
He's got the little bitty baby in His hands,
He's got the whole world in His hands.

BLOW THE MAN DOWN
Oh, blow the man down, laddies,
blow the man down.
Way, aye, blow the man down!
Oh, blow the man down, laddies,
blow the man down,
Give us some time to blow the
man down.

OH, SUSANNA
I come from Alabama
With my banjo on my knee;
I'm going to Louisiana
My true love for to see.
It rained all night the day I left,
The weather it was dry;
The sun so hot I froze to death;
Susanna, don't you cry.

Oh, Susanna, oh, don't you cry
for me;
I've come from Alabama
With my banjo on my knee.
Oh, Susanna, oh, don't you cry
for me;
I've come from Alabama
With my banjo on my knee.

He's got you and me, brother
in his hands,
He's got you and me, brother
in his hands,
He's got you and me, brother
in his hands,
He's got the whole world in
His hands.

He's got everybody here in
His hands,
He's got everybody here in
His hands,
He's got everybody here in
His hands,
He's got the whole world in
His hands.

CAMPFIRE SONGS - Quiet

BLOWIN' IN THE WIND

How many roads must a man walk down
Before you can call him a man
How many seas must a white dove sail
Before she sleeping in the sand
How many times must the cannon balls fly
Before they're forever banned
(Chorus)
The answer my friend is blowin' in the wind
The answer is blowin' in the wind

How many times must a man look up
Before he can see the sky
How many ears must one man have
Before he can hear people cry
How many deaths will it take til he knows
That too many people have died

How many years must the mountains endure
Before they are washed to the sea
How many years can some people exist
Before they're allowed to be free
How many times can a man turn his head
Pretending he just doesn't see

THIS LAND

This land is your land,
This land is my land
From California to the New York Island
From the redwood forests to the Gulf stream waters
This land is made for you and me.

As I rambled that ribbon of highway
I saw above me the endless sky way
I saw [redacted] below the golden valley
Saying this land was made for you and me.

I've roamed and rambled
And followed my footsteps
To the sparkling sands of her diamond deserts
And all around me a voice was sounding
This land was made for you and me.

When the sun comes shining
And I was strolling
Andthe wheat fields waving
And the dust clouds rolling
As the fog was lifting a voice was chanting
This land was made for you and me.

IF I HAD A HAMMER

1. If I had a hammer
I'd hammer in the morning
I'd hammer in the evening
All over this land
I'd hammer out danger
I'd hammer out a warning
I'd hammer out love between my brothers and my sisters
All over this land

2. If I had a bell
I'd ring it in the morning
I'd ring it in the evening
All over this land
I'd ring out danger
I'd ring out a warning
I'd ring out the love between my brothers and my sisters
All over this land

3. If I had a song
I'd sing it in the morning
I'd sing it in the evening
All over this land
I'd sing out danger
I'd sing out a warning
I'd sing out the love between my brothers and my sisters
All over this land

4. Well I've got a hammer, And I've got a bell
And I've got a song to sing, All over this land
It's the hammer of justice, It's the bell of freedom
It's the song about love between my brothers and sisters
All over this land

BIBLIOGRAPHY

Action Songs, National Recreation Association, New York.

Active Games and Contests, by Mason and Mitchell, Association Press, New York.

Campfire and Council Ring Programs, by Allan A. Macfarlan, Association Press, New York.

Chansons de Notre Chalet (Girl Scouts of the U.S.A., Cat. No. 23-919).

Ditty Bag, by Janet Tobitt (Girl Scouts of the U.S.A., Cat. No. 23-460).

Fun Encyclopedia, by E.O. Harbin, Abingdon-Cokesbury Press, New York.

Girl Scout Pocket Songbook (Girl Scouts of the U.S.A., Cat. No. 20-192).

Stunts and Entertainments, Association Press, New York.

Stunts, Contests, Relays, National Recreation Association, New York.